

Decision **PROPOSED DECISION OF ALJ SULLIVAN** (Mailed 10/30/2012)

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Application of Pacific Gas and Electric Company (U39M), San Diego Gas & Electric Company (U902E)) and Southern California Edison Company (U338E) for Authority to Increase Electric Rates and Charges to Recover Costs of Research and Development Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems.

Application 11-07-008
(Filed July 18, 2011)

**DECISION GRANTING AUTHORITY TO ENTER INTO A RESEARCH AND
DEVELOPMENT AGREEMENT WITH LAWRENCE LIVERMORE NATIONAL
LABORATORY FOR 21ST CENTURY ENERGY SYSTEMS
AND FOR COSTS UP TO \$152.19 MILLION**

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1. Summary

This decision authorizes Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E) to enter into a five-year research and development agreement with Lawrence Livermore National Laboratories (LLNL).

The proposed agreement is known as 21st Century Energy Systems. The expected research benefits of this project include \$552 million in savings by 2020 from improved resource planning related to the integration of renewables into the grid, potential substantial savings over the next five years from improvements in natural gas operations, improved safety and reliability from enhanced capabilities to model electricity and gas flows, and improvements in cyber security as utilities learn directly from LLNL how to deal with evolving and persistent cyber threats. In addition, the supercomputing capabilities of LLNL will enable the processing of the three terabytes of data that smart meters will produce daily. Supercomputing capabilities, for example, will enable LLNL to model grid operations in a disaggregated and refined way that will allow the companies to see where investments are needed to maintain service and to avoid investments not needed, thereby producing better service and ratepayer savings. The expected economic benefits alone dwarf the \$150 million in project costs over its five-year life.

This decision authorizes the utilities to spend up to \$30 million a year for five years on research activities, for a total of \$152.19 million total costs (when

franchise fees and uncollectibles are included). The decision also allocates these costs to each of the utilities (55% of the costs to PG&E, 35% of costs to SCE, and 10% of the costs to SDG&E) and adopts a ratemaking proposal for each utility to permit the recovery of costs.

More specifically, this decision approves the 21st Century Energy Systems research project (CES-21) for a number of reasons that will benefit utility customers: 1) the research findings are very likely to improve the safety of gas operations by reducing the gas pressure in transmission pipes needed to maintain distribution flows, by improving leak detection, and by predicting pipe breaks; 2) the project is very likely to provide benefits to ratepayers that exceed costs across both electric and gas operations by avoiding unnecessary purchases of power support services and by identifying with precision places where more grid investment is needed; 3) research pertaining to the operations of electric and gas utilities is currently underfunded; 4) the research pertaining to cyber security will better protect both electric and gas operations and customer privacy; 5) only the use of supercomputers, a core strength of LLNL, will enable utilities to process the three terabytes of data a day produced by smart meters and thereby improve grid operations and stability; 6) the proposed research uses the special research strengths of LLNL in super computing, modeling, and cyber security; 7) the proposed research program is consistent with the research goals set forth in Pub. Util. Code § 740.1;¹ and 8) the CES-21 advances the public interest, and is therefore consistent with § 399(c).

¹ All statutory references are to the Public Utilities Code unless otherwise noted.

The decision is based in part on the application's "illustrative cases" to identify productive areas of research and to show the types of benefits that the CES-21 project will produce. The decision finds that the use of "illustrative cases" is appropriate in light of the rapidly changing technologies and energy priorities that characterize California's energy industry. Indeed, requiring more details on research projects at this time would risk locking the research program into unproductive projects and would likely prevent realization of the benefits that can arise through collaborative projects based on the emerging needs of the utilities and the expertise of LLNL.

This decision examines and modifies the proposed governance and oversight of the proposed CES-21 program. This decision rejects the proposed governance structure in which the CES-21 project's Board of Directors has authority to fund research with ratepayer funds as it wishes. Instead, this decision adopts guidelines for the CES-21 research proposal and criteria that each specific research project must meet. Specifically, the Cooperative Research and Development Agreement (CRADA) must be consistent with five guidelines:

1. The CRADA must restrict research to four promising areas that are inherently related to the research goals identified in § 740.1: Gas Operations, Electric Operations, Electric Resource Planning, and Cyber security.
2. The CRADA must limit total yearly expenditures to \$30 million and total expenditures to \$150 million.
3. The Advice Letter seeking approval of the CRADA shall allocate costs with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs. These utilities may recover these costs using the regulatory mechanisms adopted in this decision.
4. The CRADA must agree that all research projects conducted under this proposal must meet the specific criteria adopted in this decision.

5. The CRADA should propose a Board of Directors of with six members, with three members chosen one each from the participating utilities and three members chosen by the utilities with relevant research backgrounds in either academia or research institutes.

The research projects performed under the CRADA must meet the following criteria:

1. The total research expenditures in a given year must not exceed \$30 million.
2. Each research project should demonstrate that it falls within the four approved areas.
3. Each research proposal must have the support of a majority of the Board of Directors and must provide an explanation if a proposed project will not be funded by all utilities.
4. Each proposed research project shall also include a “business case” analysis, as described in the application, and which, among other things, shall show that projected benefits exceed projected costs and that the research is not duplicative.

The decision requires an annual Tier 3 advice letter filing with the Commission asking approval of research proposals and projects. The annual Tier 3 advice letter filing should also include, at a minimum the proposed research projects that will be conducted in the upcoming year. The Board of Directors of the project should hold a public workshop, including members of the California Public Utilities Commission, at least 45 days prior to the filing of each advice letter to discuss research priorities and explain the business case analysis prepared for proposed research projects. The Commission’s subsequent review of this annual filing enables the Commission to ensure that the research meets the criteria adopted in this decision.

Since this decision requires the review of both the CRADA and research conducted under it through a Tier 3 advice letter filing, there is no need for the

elaborate oversight structure proposed by the utilities and opposed by The Utility Reform Network (TURN) and the Division of Ratepayer Advocates (DRA). This decision treats the application as a request for authority for the utilities to enter into a research contract, the CRADA, and to conduct research projects under the CRADA. As such, the proposed research can be clearly accommodated within the Commission's traditional processes for approving research projects (which the decision reviews at length) and there is no need for Commission participation on the CES-21 project's board, particularly in light of the Tier 3 advice letter review process. Moreover, this process, in which research projects are subject to an advice letter filing, raises no legal issues pertaining to the delegation of Commission authority.

The decision also discusses in detail the objections of TURN and DRA to specific aspects of the research proposal and resolves outstanding motions. In particular, the decision dismisses a TURN motion for the recusal of the assigned Commissioner because TURN's analysis conflates interest and due diligence in the development of policy with evidence of prejudgment. The arguments of TURN are unpersuasive, TURN's conclusions have no basis in fact, and the decision denies the motion.

2. Background

The procedural background of this matter reflects the pattern of ratemaking proceedings at this Commission that require evidentiary hearing to resolve.

On July 18, 2011, Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E) and Southern California Edison Company (SCE) (Joint Applicants) filed Application (A.) 11-07-008 requesting the Commission to:

- (1) Authorize the IOUs [investor-owned utilities, i.e. Joint Applicants] to recover the costs for funding the CES-21 [21st Century Energy Systems] Project up to a maximum of \$150 million in program funding over five years, with the funding shared among the IOUs as follows: PG&E (55%), SCE (35%), and SDG&E (10%); and
- (2) Grant such additional relief as the Commission may deem proper.²

Resolution ALJ-3278 (July 28, 2011) categorized the proceeding as ratesetting and reached a preliminary determination that hearings would prove necessary to resolve this matter.

On September 2, 2011, the DRA and TURN each filed a protest to the application.³

On September 12, 2011, the Joint Applicants filed a Reply to the Protests.⁴

On September 19, 2011, the Commission held a pre-hearing conference (PHC) in San Francisco to address the issues concerning the management of this proceeding, including proposals concerning the scheduling of the proceeding. At the PHC, the Administrative Law Judge (ALJ) concluded that the application lacked detail and ruled that the application should be amended to include testimony supporting the application.⁵

² Application at 1.

³ *Protest of the Division of Ratepayer Advocates (DRA Protest), September 2, 2011; Protest of The Utility Reform Network to Joint Application of Pacific Gas and Electric Company, San Diego Gas and Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems (TURN Protest), September 2, 2011.*

⁴ *Reply of Pacific Gas and Electric Company, San Diego Gas and Electric Company and Southern California Edison Company to Protests, September 12, 2011.*

⁵ PHC, Transcript (TR) at 48.

On October 18, 2011, an Assigned Commissioner Ruling and Scoping Memo set the scope and schedule for this proceeding.

On October 19, 2011, the Joint Applicants amended their application and served prepared testimony on parties to this proceeding.

On November 2, 2011, in response to the amended application, DRA filed a protest to the application.⁶

On November 7, 2011, TURN filed a Motion to Dismiss the Joint Application.⁷ Joint Applicants opposed both motions.

On January 17, 2012, the ALJ issued a Ruling denying TURN's Motion to Dismiss and amending the procedural schedule.⁸ The Ruling also requested that the Rebuttal Testimony of the Joint Applicants provide greater detail on the proposed governance structure overseeing the 21st Century Energy Systems research project (CES-21).

On January 26, 2012, an ALJ Ruling amended the schedule for evidentiary hearings.⁹

On March 22, 2012, TURN filed a motion seeking the recusal of assigned Commissioner Peevey.¹⁰

⁶ *Protest of the Division of Ratepayer Advocates*, November 2, 2011.

⁷ *Motion of the Utility Reform Network to Dismiss the Joint Application of Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems*, November 7, 2011.

⁸ *Administrative Law Judge's Ruling Denying The Utility Reform Network's Motion to Dismiss and Amending Procedural Schedule*, January 17, 2012.

⁹ *Administrative Law Judge's Ruling Amending Procedural Schedule*, January 26, 2012.

¹⁰ *Motion of The Utility Reform Network Seeking Recusal of Assigned Commissioner Peevey*, March 22, 2012.

On March 30, 2012, DRA filed a motion to strike portions of the rebuttal testimony, arguing that it raised new issues for the first time.¹¹

On April 3, 2012, TURN filed a response to the DRA motion to strike.¹²

On April 3, 2012, DRA and TURN, filed a joint motion to stay the hearings.¹³

On April 4, 2012, a telephonic conference¹⁴ was held to consider both DRA's motion to strike and the motion of DRA and TURN to stay evidentiary hearings. As a result of the conference, the hearings were rescheduled from April 10-11, 2012 to May 10-11, 2012, thereby giving DRA and TURN additional time to conduct discovery and prepare cross-examination questions.¹⁵ No testimony was stricken from the record.

On April 24, 2012, SCE filed proof of compliance with Rule 13.1(b).¹⁶ SDG&E made a similar compliance filing on May 1, 2012,¹⁷ and PG&E made a similar compliance filing on May 8, 2012.¹⁸

¹¹ *Motion of Division of Ratepayer Advocates to Strike Portions of the Rebuttal Testimony Submitted by the Joint Utilities*, March 30, 2012.

¹² *Response of The Utility Reform Network to Motion of Division of Ratepayer Advocates to Strike Portions of the Rebuttal Testimony Submitted by the Joint Parties*, April 3, 2012.

¹³ *Joint Motion of Division of Ratepayer Advocates and The Utility Reform Network to Stay Hearings in Order to Preserve Fundamental Fairness between the Parties Regarding New Arguments Submitted by the Joint Utilities*, April 3, 2012.

¹⁴ The scheduling and results of the telephonic conference are reported in e-mails dated April 3 and April 4, 2012, from Sullivan, Timothy J., that are part of the correspondence file in this proceeding.

¹⁵ *Notice Resetting Dates of Evidentiary Hearing*, April 5, 2012.

¹⁶ *Southern California Edison Company's Proof of Compliance with Rule 13.1(b)*, April 24, 2012.

Evidentiary Hearings took place at the Commission Offices in San Francisco on May 10 and May 11, 2012.

Parties filed opening briefs on July 20, 2012¹⁹ and reply briefs on August 1, 2012.²⁰ With the submission of reply briefs, the proceeding was deemed submitted.

3. Jurisdiction

California state law has supported Commission approval and oversight of utility research projects for many years. The Commission is “a ‘state agency of constitutional origin with far-reaching duties, functions and powers,’ whose ‘power to fix rates [and] establish rules’ has been ‘liberally construed.’”²¹

In general, the Commission has broad authority over public utilities to do all things cognate and germane to the regulation of public utilities.²² By statute,

¹⁷ *San Diego Gas & Electric Company Rule 13.1 Proof of Publication of Notice of Hearings*, May 1, 2012.

¹⁸ *Pacific Gas and Electric Company's Proof of Rules 13.12(b) Compliance*, May 8, 2012.

¹⁹ *Opening Brief of the Division of Ratepayer Advocates* (DRA Brief), July 20, 2012; *Opening Brief of The Utility Reform Network* (TURN Brief), July 20, 2012; and *Opening Brief of Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company* (Joint Applicants Brief), July 20, 2012.

²⁰ *Reply Brief of the Division of Ratepayer Advocates*, August 7, 2012; *Reply Brief of The Utility Reform Network*, August 7, 2012; and *Reply Brief of Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company*, August 7, 2012.

²¹ *Southern California Edison Co. v. Peevey* (2003) 31 Cal. 4th 781, 792 (internal citations omitted).

²² *Consumers Lobby Against Monopolies v. Public Utilities Com.* (1979) 25 Cal.3d 891, 909-910. The Commission's broad authority is, however, limited by both “express legislative directions” to the Commission and “restrictions upon [the Commission's] power found in other provisions of the [Public Utilities Act] or elsewhere in general law.” *Assembly v. Public Utilities Commission* (1995) 12 Cal.4th 87, 103.

The commission may supervise and regulate every public utility in the State and may do all things, whether specifically designated in this part or in addition thereto, which are necessary and convenient in the exercise of such power and jurisdiction.²³

This broad grant of authority to the Commission permits the Commission, as part of its general supervision and regulation of a public utility, to either require or approve research projects.

This grant of authority is balanced by a broad responsibility of the Commission to ensure that all charges are reasonable. Section 451 provides in part that:

All charges demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable. Every unjust or unreasonable charge demanded or received for such product or commodity or service is unlawful.²⁴

Thus, the Commission has the responsibility to determine whether the charges used to finance a research project are “just and reasonable.”

For research, development and demonstration (RD&D) projects, the Pub. Util. Code provides more specific guidance. Section 740 states:

For purposes of setting the rates to be charged by every electrical corporation, gas corporation, heat corporation or telephone corporation for the services or commodities furnished by it, the commission may allow the inclusion of expenses for research and development.²⁵

²³ § 701.

²⁴ § 451.

²⁵ § 740.

The Public Utilities Code also provides guidance to the Commission in reviewing proposed research projects:

The commission shall consider the following guidelines in evaluating the research, development, and demonstration programs proposed by electrical and gas corporations:

- (a) Projects should offer a reasonable probability of providing benefits to ratepayers.
- (b) Expenditures on projects which have a low probability for success should be minimized.
- (c) Projects should be consistent with the corporation's resource plan.
- (d) Projects should not unnecessarily duplicate research currently, previously, or imminently undertaken by other electrical or gas corporations or research organizations.
- (e) Each project should also support one or more of the following objectives:
 - (1) Environmental improvement.
 - (2) Public and employee safety.
 - (3) Conservation by efficient resource use or by reducing or shifting system load.
 - (4) Development of new resources and processes, particularly renewable resources and processes which further supply technologies.
 - (5) Improve operating efficiency and reliability or otherwise reduce operating costs.²⁶

More to the point, the Legislature has made the funding of research and development a cornerstone of California's energy policy. Section 399 (c) provides:

²⁶ § 740.1.

(c) The Legislature further finds and declares that in order to ensure that the citizens of this state continue to receive safe, reliable, affordable, and environmentally sustainable electric service, it is essential that prudent investments continue to be made in all of the following areas: 5) To advance public interest research, development and demonstration programs not adequately provided by competitive and regulated markets.²⁷

For the period from January 1, 2002 to January 1, 2012, § 399.8(d)(1) required the Commission to order SDG&E, SCE, and PG&E to collect \$62,500,000 per year to fund “research, development and demonstration.”²⁸ These funds were used to support the California Energy Commission’s (CEC) Public Interest Energy Research (PIER) program. In addition, § 381 required a “special rate component to collect the revenues to fund these programs.” This requirement for special funding for basic research ended in 2012, but the state policy announced by the Legislature in § 399(c) supporting research in the public interest remains in effect.

The Commission recently directed that each of the three large electric IOUs consolidate its research efforts in the Electric Program Investment Charge (EPIC) program’s triennial applications on a going forward basis, although this directive does not apply RD&D funding decisions already made by the Commission or to RD&D funding requests in Commission proceedings already existing at the time of the EPIC proceeding but not yet decided.²⁹ Since this proceeding was initiated July 2011, before the EPIC rulemaking proceeding was instituted in October 2011,

²⁷ § 399(c)(5).

²⁸ § 399.8(d)(1).

²⁹ Decision (D.) 12-05-037 at 29.

the directives contained in D.12-05-037 do not apply to the Joint Applicant's request before the Commission in this proceeding, and the Commission's issuance of this decision today does not contradict D.12-05-037's directives.

Historically, the Commission supported significant research efforts, both by the utilities and by the Electric Power Research Institute (EPRI). In D.93-05-011, for example, the Commission noted:

EPRI plans, funds and manages a nationwide coordinated research and development (R&D) program for its member electric utilities. EPRI's 1992 budget was approximately \$580 million of which some \$400 million is generated by dues. California utilities currently provide \$27 million in EPRI dues.³⁰

In D.93-05-011, the Commission authorized PG&E to recover \$15,433,000 for 1993 EPRI dues and approved "equivalent amounts subject to appropriate escalation in 1994 and 1995."³¹

Each of the electric utilities in this proceeding had funded research through the payment of dues to EPRI for many years. The expenses for dues, and the resultant research, were reviewed by the Commission as part of each General Rate Case filing. Under the system of dues payments, ratepayers funded research with little direct input from the Commission on research projects, but with strict oversight into the level of support and the resulting costs. A review of the level of support for research, the resulting expenses, and EPRI research initiatives were common parts of a General Rate Case.

The practice of funding research through dues payments to EPRI was discontinued in the mid-90's. At that time, the Commission sought to introduce

³⁰ D.93-05-011 (1993) 49 CPUC2d 209, 1993 Cal. PUC LEXIS 380 *3.

competition in electric generation as part of market deregulation. This policy, which envisioned no role for PG&E, SDG&E and SCE in power generation, rendered EPRI's research on non-nuclear central station generation irrelevant for California. The Commission noted in D.95-12-055:

As the Commission moves the industry toward increased competition, PG&E's RD&D in generation is not appropriately funded by the general body of ratepayers. Its RD&D efforts should focus more on improvements in the distribution and transmission system. PG&E's proposal [to remove EPRI dues from rates] here recognizes this trend.³²

Even as this 1995 decision led to a cessation in PG&E's funding of EPRI research, the decision seems prescient in its identification of the need to focus research on the issues concerning the safe and reliable operations of distribution and interconnected transmission systems. These issues are the focus of the research of the CES-21 project which the Joint Applicants have placed before us in this proceeding.

Finally, the Commission's General Order 96-B creates an advice letter review process and states:

The advice letter process provides a quick and simplified review of the types of utility requests that are expected neither to be controversial nor to raise important policy questions. The advice letter process does not provide for an evidentiary hearing ...³³

³¹ D.93-05-011 (1993) 49 CPUC2d 209, 1193 Cal. PUC LEXIS 380, *15-*16.

³² D.95-12-055 (1995) 63 CPUC2d 570.

³³ General Order 96-B, General Rules, Section 5.1, Matters Appropriate for Advice Letters.

General Order 96-B creates three different levels of review. Because of the concerns expressed by parties concerning the level of review of the proposed research, this decision briefly discusses the level of review associated with Tier 1, Tier 2, and Tier 3 advice letters.

General Order 96-B identifies Tier 1 or Tier 2 advice letters as an appropriate review process for those matters that can be resolved by Commission staff because the decisions required are ministerial. General Order 96-B states:

An advice letter is subject to disposition by the reviewing Industry Division whenever such disposition would be a "ministerial" act, as that term is used regarding advice letter review and disposition. (See Decision 02-02-049.) Industry Division disposition is appropriate where statutes or Commission orders have required the action proposed in the advice letter, or have authorized the action with sufficient specificity, that the Industry Division need only determine as a technical matter whether the proposed action is within the scope of what has already been authorized by statutes or Commission orders. In addition, the Industry Division will (1) reject any advice letter where the advice letter or workpapers are clearly erroneous, including without limitation where there are clear inconsistencies with statute or Commission order, and (2) reject without prejudice an advice letter whose disposition would require an evidentiary hearing or otherwise require review in a formal proceeding.

An advice letter will be subject to Industry Division disposition even though its subject matter is technically complex, so long as a technically qualified person could determine objectively whether the proposed action has been authorized by the statutes or Commission orders cited in the advice letter. Whenever such determination requires more than ministerial action, the disposition of the advice

letter on the merits will be by Commission resolution, as provided in General Rule 7.6.2.³⁴

The General Order, in discussing the suitability of specific projects to a Tier 1 review, references D.93-02-013 as providing an example of the type of contract review suitable for Tier 1. D.93-02-013, which was adopted before General Order 96-B, set up an expedited seven-day review process for long-term gas storage contracts as long as the contracts met the guidelines adopted in that decision. There were only two guidelines: one for duration of the contract and one for pricing the contract. The pricing guidelines called for pricing at long run marginal costs, plus risk premiums, and scaled to meet system revenue requirement – not a simple task. The decision states:

... but contracts that have durations within the announced guidelines and that are priced at LRMC [Long Run Marginal Cost] scaled to meet system revenue requirement -- without discounts, load balancing premiums, or other special features -- will not be subject to further Commission approval. Contracts meeting the guidelines will become effective seven days after filing. This short delay is necessary to allow time for staff review of conformance with the duration and price guidelines.³⁵

This process for reviewing contracts, adopted before General Order 96-B, became an example of a Tier 1 advice letter review process and an example of the specificity required for ministerial delegation for either a Tier 1 or Tier 2 advice letter review.

Thus, the review of a contract to determine that it conforms to Commission policies is one of the prime examples in which disposition of a matter by industry

³⁴ General Order, General Rule 7.6.1.

³⁵ D.93-02-013 (1993) 48 CPUC2d 107.

staff is appropriate. Since this decision authorizes the utilities to enter into a contract, the Cooperative Research and Development Agreement (CRADA), consistent with the specific policies adopted in this decision, a ministerial review offers a possible way for the Commission to proceed.

Under a Tier 3 advice letter review, the industry division prepares a resolution for a vote at the Commission meeting. General Order 96-B states:

The resolution will contain the Industry Division's recommended disposition and analysis supporting such disposition. The resolution will also contain an attachment listing all persons served with the resolution, including the utility filing the advice letter, persons protesting or responding to the advice letter, and any third party whose name and interest in the relief sought appear on the face of the advice letter.³⁶

In a Tier 3 advice letter review, a matter is subject to the scrutiny of the full Commission in a public meeting and enables the Commission to address matters through advice letters that go beyond a ministerial review. In addition, over the course of years, a Tier 3 advice letter review has come to signal that the Commission views the issues addressed in the advice letter as rising to a level of high importance to California, and deserving of review at the highest levels of the Commission.

No matter what the tier of the advice letter, Commission review is facilitated by specificity in the decision authorizing the filing of an advice letter. This decision, therefore, seeks to establish clear criteria to guide the Commission's review.

³⁶ General Order 96-B, General Rule 7.6.2.

4. The Proposed RD&D Contract

The central issue before the Commission in this proceeding is whether the Commission should grant authority for the Joint Applicants to enter into a CRADA, a contract, which would create a research program known as the CES-21 Project.

The CES-21 Project would spend up to “\$150 million over five years, with the funding shared among the IOUs” with PG&E paying 55%, SCE paying 35% and SDG&E paying 10%.³⁷ The funds would “recover the costs associated with a five-year CRADA with Lawrence Livermore National Laboratory.”³⁸ The Joint Applicants state that “CES-21 Project activities and associated costs primarily will center around ... Cyber Security, Electric Resource Planning and Electric and Gas System Operations.”³⁹ The Joint Applicants state:

In a nutshell, the objective of the CES-21 Project is to apply computationally-based problem solving resources to the emerging challenges of the 21st century energy system (electric and natural gas) for California. The project will utilize a joint team of technical experts from the IOUs and [Lawrence Livermore National Laboratory] LLNL who will combine data integration with the nation’s most advanced modeling, simulation and analytical tools provided by LLNL to provide unprecedented problem-solving and planning necessary to achieve California’s ambitious energy and environmental goals for the 21st century.⁴⁰

³⁷ Exhibit U-1 at 1-1.

³⁸ *Id.*

³⁹ *Id.* at 1-3.

⁴⁰ *Id.* at 1-3 to 1-4.

The Joint Applicants contend that the CES-21, with its tools and resources, should “translate into better operational performance, emergency preparedness, and cyber and physical security.”⁴¹

Concerning the projects, the Joint Applicants state:

The Joint Utilities and LLNL in their testimony identified potential initial projects for CES-21 that are not exclusive, but which were chosen because each is in a category or cluster of strategic “problems” and “opportunities” which the Joint Utilities and most energy policymakers believe should be a priority for further research, development and demonstration. As other high priority strategic problems and opportunities are identified, those too will be considered for CES-21 funding. However, the Project will not fund “undefined research.” In addition, as described in more detail ... below, the governance process will ensure that the funded research is defined, including evaluation of costs and benefits, consistent with other utility customer-funded RD&D programs.⁴²

For each of the research areas identified, the Joint Applicants provide details concerning the area of investigation and its potential for providing benefits.

4.1. Electric Resource Planning

For the area of electric resource planning, the Joint Applicants provided testimony that “utilities currently use commercial off-the-shelf or in-house developed modeling tools for planning electric systems” but that “these models are computationally intensive yet limited in their ability to represent the

⁴¹ Joint Applicants, Opening Brief at 10.

⁴² *Id.*

complexity of the electric grid.”⁴³ The Joint Applicants state that “CES-21 will seek to augment the functionality of existing models to better represent the complexity and responsiveness of the grid, as well as the range and volume of possible scenarios.”⁴⁴ The Joint Applicants state that “[b]ased on these potential modeling projects ... CES-21 could provide”⁴⁵ illustrative benefits of \$30 million per year⁴⁶ in reduced load following costs and \$552 million in reduced resources⁴⁷ needed to integrate renewable resources.

4.2. Electric and Gas Operations

In the areas of electric and gas operations, the Joint Applicants have also identified particular areas of research. For electric operations, the Joint Applicants argue that enhanced monitoring and control capabilities will help integrate renewable intermittent resources that are critical to meeting California’s Renewables Portfolio Standard and for managing the use of Once-Through Cooling Resources.

For gas operations, the Joint Applicants argue that through the use of supercomputing systems and models, “utilities could gain improvements in modeling speed, resolution, and fidelity”⁴⁸ and thereby better calculate “pressure drops on a pipeline system while taking into account the various compressors,

⁴³ *Id.* at 11.

⁴⁴ *Id.* at 12.

⁴⁵ *Id.* at 14.

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.* at 22.

regulators and other equipment on the system.”⁴⁹ They contend that advanced operational monitoring and modeling will facilitate “leak detection, realistic training simulations, and ‘what if’ modeling”⁵⁰ thereby enhancing safety. In particular, advanced modeling could permit the gas companies to reduce pressures in the transmission system and still meet distribution pressure needs, thereby improving both safety and operating efficiencies.⁵¹ In addition, Joint Applicants maintain that advanced computing will enable gas operations to model “how different flow control devices turn on and off and how that might affect pressure within the lines” and will “interrogate the physics” to determine “what does it take for a pipe to break as a function of, say, the soil it’s in.”⁵²

The Joint Applicants noted that expenditures for gas transmission are “approximately \$175 million per year” and testified “that if these expenditures could be reduced by just 1 percent as a result of enhanced modeling capabilities, the savings would amount to \$1.75 million per year, or \$8.75 million over five years.”⁵³ The Joint Applicants did not monetize the benefits of improved safety, which can be difficult to estimate.

4.3. Cyber Security

In the area of cyber security, “one of the initial priority projects that CES-21 will consider is using LLNL cyber-security experts and facilities to enable the IOUs to meet these cyber-security challenges, including building a more resilient,

⁴⁹ *Id.*

⁵⁰ *Id.*

⁵¹ TR at 242.

⁵² TR at 124.

⁵³ Joint Applicants Opening Brief at 23.

reliable grid and protecting customer privacy.”⁵⁴ The Joint Applicants argue that the collaboration with LLNL will produce cyber security benefits in three areas: “(1) information sharing, (2) through leadership via an active Public/Private partnership and (3) commercialization of cyber security operational capabilities.”⁵⁵ The strategy of the cyber security program is to build on the vast experience of LLNL in securing its weapons research and modeling capabilities from cyber-attacks. The participation of LLNL will enable researchers to “simulate, if you will, our technical environment and understand which areas of weaknesses are most likely to have the most significant negative impacts to reliability, to customer service, to operational capabilities, and, therefore, further optimize ... our finite set of resources on the things that are most valuable.”⁵⁶

As with safety, the Joint Applicants did not monetize cyber security privacy and system reliability benefits, which are difficult to quantify.

4.4. Governance

To guide the CES-21 research process over its five-year life, the Joint Applicants propose “that CES-21 expenditures and projects would be subject to an open and consensual governance process, including direct participation by the Commission itself in the investment planning and budget decisions of the program.”⁵⁷

The Joint Applicants propose a detailed governance process, as follows:

⁵⁴ *Id.* at 24.

⁵⁵ *Id.* at 25.

⁵⁶ TR at 247-248.

⁵⁷ Joint Applicants Opening Brief at 32.

The CES-21 governance process proposed by the Joint Utilities includes the following key elements which meet – and in several respects, exceed – the governance and Commission oversight requirements for utility energy RD&D:

- The CES-21 Project will be governed by a Board of Directors consisting of voting members from each of the Joint Utilities, the California Public Utilities Commission (CPUC), and a member from academia appointed by the CPUC in a public process after consultation with the Energy Commission and relevant leaders from California research and academic institutions. In addition, non-voting members from the Energy Commission and California Independent System Operator will be included. The Board of Directors will be independent of LLNL and other potential providers of services under CES-21.
- The meetings of the Board of Directors will be open to the public and subject to public access in the same way as meetings of other California public agencies.
- Prior to expending any funds authorized by this Application, the Joint Utilities and LLNL will negotiate and enter into a CRADA, which will be consistent with the provisions in the CES-21 Application and subject to final approval by the Board of Directors for the CES-21. The services provided by LLNL under the CRADA, which will be a five-year agreement, will be subject to the standards under the CRADA and U.S. Department of Energy (DOE) regulations for CRADAs, including the right of the Joint Utilities to perform audits of LLNL's performance and to withhold payments for non-performance or default on a specific work order, as provided under CRADA regulations.
- The CES-21 Board of Directors will approve the scope of work and administration of the specific research projects funded by CES-21. The Board of Directors also will have the authority to select an executive director and staff recommended by LLNL to manage the project activities, and may appoint such technical and advisory committees as it deems appropriate to assist in the project activities.

- In addition, the Board of Directors will approve a strategic plan, annual budgets, and allocation of staff and other resources to provide services under individual work orders requested by each utility (or jointly) and the proportional share of funding set forth in the Proposal. The Board of Directors will not have the authority to approve any new commitments or expenditures extending beyond the five-year term of the CRADA, or beyond the authority granted in this Application. All funding of projects to support the work orders, including procurement of equipment, facilities, tools, computer software and hardware, will be subject to approval by the Board of Directors.⁵⁸

The proposed CRADA will also permit early termination by the active parties:

The IOUs and LLNL, respectively, will have the right to terminate the CRADA upon 30 days written notice, in which case the obligation for performance will be terminated for all services that have not already been performed or paid for.⁵⁹

In addition to specifying the structure and operations of the Board of Directors, the CES-21 project places responsibility for specific governance tasks on the Board of Directors. These include: determining the “need for research;”⁶⁰ avoiding “duplicative research or funding;”⁶¹ ensuring the “competitive solicitation of services;”⁶² and ensuring the “transparency and public oversight of

⁵⁸ *Id.* at 33-34, footnotes omitted.

⁵⁹ Application at 12.

⁶⁰ Joint Applicants Opening Brief at 34.

⁶¹ *Id.*

⁶² *Id.* at 35.

costs, benefits and deliverables.”⁶³ In addition, in supplemental testimony,⁶⁴ the Joint Applicants testified that the Board of Directors will “select projects that address the critical energy issues facing utilities, and that are in the best interest of California utility customers.”⁶⁵

Finally, the Joint Applicants detail the responsibilities of the Board of Directors, CES-21 goals, the selection of an Executive Director and the Executive Director’s responsibilities, the need to develop and review “the business case” for each research project, and the need for a Research Director for each project.⁶⁶ Concerning “the business case,” the Joint Applicants state that it:

will assess: (1) need for the research; (2) research goals and desired results; (3) similar research performed by others to date; (4) avoidance of duplicative research; (5) competitive alternatives to the provision of services from LLNL; (6) partnership opportunities with outside experts; (7) deliverables and milestones; (8) cost, staffing requirements and responsibilities; and (9) benefits to gas and electric customers.⁶⁷

4.5. Other Elements

The Joint Applicants propose that:

All equipment, tools, facilities, computer software and hardware, and other tangible and intangible assets, including patents, trademarks, copyrights and other intellectual property, that are procured or developed using the funding for the applied research and development element of the CRADA will be owned by the

⁶³ *Id.* at 35.

⁶⁴ Exhibit U-2.

⁶⁵ Joint Applicants Opening Brief. at 36.

⁶⁶ *Id.* at 36-37.

⁶⁷ *Id.* at 36.

IOUs for the benefit of their customers in accordance with a joint ownership arrangement among the IOUs.⁶⁸

The Joint Applicants also describe the project as having a goal of fostering private/public partnerships “between outside experts and LLNL, the Joint Utilities, and other California energy and environmental policymakers.”⁶⁹

The Joint Applicants describe in their Supplemental Testimony how they plan to gain the participation of both academic researchers and third party vendors. The Joint Applicants state:

One of the goals of CES-21 will be to obtain access to experts? and foster private/public partnerships between outside experts and LLNL, the IOUs, and other California energy and environmental policymakers. These experts may be affiliated with universities (e.g., University of California system, Stanford, the California State University system, Massachusetts Institute of Technology), California and other research centers (e.g., Lawrence Berkeley National Lab, Electric Power Research Institute, National Renewable Energy Laboratory, Pacific Northwest National Laboratory), industry, engineering/consulting firms and other entities. The Board will carefully review this element of the business case to ensure that full advantage is taken of partnership opportunities and available outside expertise.⁷⁰

Concerning academic researchers, the Joint Applicants state:

One of the roles of the member of the Board representing academia will be to focus on this very issue and act as a liaison with the major sources of research expertise available to support each project. Once the research project is approved, the research team will collaborate with the outside experts and participating

⁶⁸ Ex. U-1 at 1-14.

⁶⁹ Joint Applicants Opening Brief at 38.

⁷⁰ Ex. U-2 at 4.

research centers or academic institutions and involve them in the research as appropriate and to varying degrees, on a project by project basis.⁷¹

Concerning third party vendors, the Joint Applicants state:

LLNL and the IOUs therefore expect to work collaboratively with existing vendors in Silicon Valley and across the State to enable and expedite the development of such enhanced tools to address pressing challenges facing the industry.⁷²

Concerning the project financing, “the Joint Utilities are specifically requesting a finding by the Commission that the funding requested in this application is expressly conditioned on full recovery of all verified costs in rates without further reasonableness review or restriction.”⁷³ Further, the Joint Applicants seek to request the recovery of revenue requirements “through distribution rates, except for projects that are generation related.”⁷⁴ In addition, under the proposal, if a utility does not approve of a project, it need not participate in the financing, but the project may proceed if approved by the Board of Directors:

If a utility does not approve a project, the project may go forward as a non-joint project, subject to approval by the Board of Directors. The participating utilities that want to go forward with the non-joint project without funding from the non-participating

⁷¹ *Id.* at 4-5

⁷² *Id.* at 5.

⁷³ Joint Applicants Opening Brief at 44.

⁷⁴ *Id.* at 44.

utility will negotiate their respective funding percentages for the non-joint project, subject to approval of the Board of Directors.⁷⁵

Finally, each utility specifies a cost recovery proposal consistent with its regulatory accounts.⁷⁶

5. Major Issues Before the Commission

The major issue before the Commission is whether to authorize the Joint Applicants to enter into the CRADA contract that creates the CES-21 Project as proposed. In addressing this issue, the Commission can approve the project as proposed, require modifications, or reject the proposal.

More specifically, the Commission must determine how to act on this application for authority to increase electric rates to engage in a five-year research project with LLNL that will cost \$150 million.

In conjunction with this major issue, there are a series of preliminary issues concerning whether the Commission has authority to approve the proposed research project and the governance structure it proposes.

In addition, if the Commission has authority to approve a research project, there are subsidiary issues concerning the reasonableness of this course of action. In particular, the Commission must determine whether the proposed research, is reasonable to fund and consist with the provisions of the Pub. Util. Code.

⁷⁵ *Id.* at 43.

⁷⁶ *See Id.* at 45-46.

5.1. Does the Commission Have Authority to Fund the CES-21 Project?

The review of the Commission's statutory framework and current policies makes it clear that the Commission has authority to fund RD&D projects. In general, parties do not contest this authority.

Parties do, however, contest whether the proposed research, which leaves the selection and day-to-day administration of the research projects in the hands of an oversight board consisting of utility and Commission appointees, is lawful.

This section addresses the positions and arguments of the active parties on this issue.

5.1.1. Positions of Parties

DRA and TURN argue that the Commission cannot approve the research project as proposed by the Joint Applicants without committing legal error.

Specifically, TURN argues that the proposed board with voting seats assigned to three utility appointees, one Commission appointee, and one academic appointee has the following effects:

First, the Joint Utilities control a majority of the voting seats and therefore have the ability to control the Board's decisions. Second, the Commission, with just one seat, cannot control the outcome of Board votes. Indeed, the balance of power on the board indisputably favors the utilities; the Commission's representative could not require or prevent any action, but if the three utility-appointed members wish to see the project approved, the project would be able to be approved.⁷⁷

⁷⁷ TURN Opening Brief at 17.

TURN argues further that the Commission distinguishes between “program oversight” and “program administration” and that the Commission itself has determined that:

... while it might be appropriate for the Commission to accept input on various non-discretionary matters, “it can and should maintain appropriate responsibility for final authority of the program, particularly in so far as policy and programmatic matters and final funding levels are concerned.”⁷⁸

TURN argues that the CES-21 Project grants the Board of Directors “complete discretion on which projects to fund” and that this would be “the exercise of discretion that the Commission has previously recognized may **not** be delegated.”⁷⁹

TURN argues further:

The legality of the Commission’s delegation of authority to a third-party entity not subject to its jurisdiction depends on the nature of the decisions the third-party entity would make. Where, as here, the Board would engage in matters such as determining reasonable costs, program rules, and similar matters that fall within the “program oversight” category, the Commission cannot delegate the ultimate decision-making authority.⁸⁰

TURN also argues that the “Commission has no authority or jurisdiction over LLNL, and its authority or jurisdiction over the CES-21 Project itself would

⁷⁸ TURN Opening Brief at 20, citing D.11-12-035.

⁷⁹ TURN Opening Brief at 20, emphasis in original.

⁸⁰ *Id.* at 21.

be bounded by the contractual terms embodied by the CRADA [cooperative research and development agreement], and might also prove to be ‘none.’”⁸¹

TURN argues further that the “degree of delegation exceeds the level of delegation permitted in prior decisions where ratepayer funds were involved.”⁸² TURN then proceeds to discuss the California Emerging Technology Fund, the California Clean Energy Fund and the Stewardship Council and argues that they fail to provide a precedent for the proposed research plan.

Finally, TURN argues that the CES-21 is “rooted in addressing climate change”⁸³ and that the Commission by law:

... shall not adopt or execute any similar order or decision establishing a research program for climate change unless expressly authorized to do so by statute.⁸⁴

Thus, TURN concludes that law prohibits the Commission from approving the CES-21 research program.

DRA also argues that “the proposed governance is an illegal delegation of the Commission’s responsibilities, has no structure or limits and it is unclear how it would function.”⁸⁵ DRA states that:

[T]he reality is that the utilities will maintain control over the decision-making process and outvote the Commission representative at any time. This would result in an unchecked delegation to the utilities of authority for spending ratepayer

⁸¹ *Id.* at 21-22.

⁸² *Id.* at 22.

⁸³ *Id.* at 26.

⁸⁴ *Id.* at 25.

⁸⁵ DRA Opening Brief at 13.

funds. In the limitless process envisioned by the utilities, they could fund any research project they chose, whether in California or elsewhere and there would be nothing the Commission could do afterward.⁸⁶

Finally, DRA argues that the proposal is too vague to enable the Commission to review it. DRA states:

The Application suffers from a lack of specificity in its project proposals. Before the Commission appropriates funds for research, development and deployment projects it should first identify exactly what it is funding and the purported benefits that may follow. As previously mentioned, the applicants have not yet identified specific projects and will leave that determination to the Board of Directors. However, as explained at the Hearing, there is no limitation on what the Board of Directors may fund ...

The Joint Applicants argue that “TURN’s and DRA’s legal and policy arguments against CES-21 should be rejected.”⁸⁷ More specifically, the Joint Applicants argue that the governance structure does not “constitute an “unlawful” delegation of the Commission’s authority.”⁸⁸ The Joint Applicants compare the Commission-approved EPIC program and its review process with the proposed CES-21 projects and its governance structure and argues that the “governance process is remarkably similar,” and therefore legal.⁸⁹ The Joint Applicants argue that this is the case because:

CES-21, like EPIC, includes an overall strategic investment plan outlined in the CES-21 application, an annual budgeting and

⁸⁶ *Id.* at 13.

⁸⁷ Joint Applicants Reply Brief at 18.

⁸⁸ *Id.* at 15.

⁸⁹ *Id.* at 4.

planning process approved by the collaborative board of directors, and an opportunity for public and stakeholder input. CES-21 includes formal criteria for approval of specific projects similar to the criteria adopted by the Commission for investment plans under EPIC. CES-21 includes open and transparent reporting to the Commission on an annual basis, just like EPIC.⁹⁰

The Joint Applicants argue that the exercise of discretion is not exceptional, but is common in any RD&D project approved by the Commission. The Joint Applicants state that:

... the Commission approved an EPIC process under which the Energy Commission and the individual utilities will submit RD&D “investment plans” to the Commission for review and approval, and if approved, will then proceed themselves to solicit, approve and implement specific RD&D projects consistent with the approved “investment plans.”⁹¹

Furthermore, the Joint Applicants cite to the Commission’s traditional rate case process of approving research projects on a programmatic basis, without review of the specific research projects. The Joint Applicants argue:

[I]n the Commission’s more traditional reviews of the individual utilities’ General Rate Cases, the Commission has routinely approved the utilities’ RD&D expenditures on a programmatic basis, leaving the utilities with discretion to implement specific projects consistent with the Commission’s guidance and criteria for the programs.⁹²

The Joint Applicants also counter TURN’s argument that the degree “of delegation proposed for CES-21” exceeds that approved by the Commission in

⁹⁰ *Id.* at 4.

⁹¹ *Id.* at 15.

⁹² *Id.* at 15-16.

other proceedings.⁹³ The Joint Applicants argue instead that discretion is appropriately constrained because:

The Joint Utilities have adequately described the scope of proposed research and the Application seeks approval of this scope of work (i.e., “program elements” per D.06-01-024).⁹⁴

The Joint Applicants also argue that the discretion exercised by the Board of Directors and staff in the CES-21 research is consistent with legal precedents and Commission practice, stating:

[T]he Joint Utilities’ proposal to establish a Board of Directors to administer the CES-21 program is legally no different than the Commission’s decision to delegate authority to administer the [California Solar Initiative] CSI RD&D program to staff, consultants and the [California Energy Commission] CEC. The Joint Utilities are simply requesting that a similar amount of discretion be delegated to a Board of Directors that includes a Director representing the CPUC. As described previously, such a governance approach will provide the Commission with more control and oversight than it normally exercises over RD&D programs.⁹⁵

Finally, the Joint Applicants also argue against the legal contention of TURN and DRA that Assembly Bill (AB) 1338 bars the funding of the CES-21 project. The Joint Applicants argue:

⁹³ *Id.* at 16.

⁹⁴ *Id.* at 17. D.06-01-024 established the California Solar Initiative. This decision stated that, since the decision defined “program elements” it was possible for the Commission to delegate the administrative tasks associated with this program to a third party. The decision delegated administration of an RD&D program to Commission staff, the utilities, and third party consultants. (2006 Cal. PUC LEXIS 529 *56.)

⁹⁵ *Id.* at 17.

When similar arguments were raised regarding the applicability of AB 1338 to the scope of RD&D activities proposed in the EPIC proceeding, the Commission expressly found that it had adequate and broad legal authority under other provisions of the Public Utilities Code to fund energy RD&D programs. In any event, the scope of RD&D proposed for CES-21 does not include “climate change research,” and so the prohibition in AB 1338 is inapplicable to CES-21 on its facts.⁹⁶

5.1.2. Discussion: The Commission has Authority to Fund a Broad Range of Research Projects

Any review of ratepayer-funded RD&D projects must address the inherent tension between Commission oversight over the expenditure of ratepayer funds and the creative, sometimes unpredictable process by which RD&D evolves and ultimately produces ratepayer benefits. As with many issues that come before the Commission, regulation must strike a balance. In this case, the Commission must strike a balance between, so that the pre-review of proposals and imposition of regulatory controls over the IOUs’ actions and expenditures does not so constrain research activities that they limit the ability of the research to adapt to the results produced in the research process and ultimately jeopardize the ratepayer benefits that research can produce.

In conducting research, flexibility is necessary to enable the researchers to uncover and pursue areas of research that their initial investigations show are promising and to abandon areas that initial research suggests will not prove productive.

Because of the inherent complexity of the issues raised by the funding of research, it is not surprising that both legislation and the Commission have

⁹⁶ *Id.* at 18.

addressed these issues previously. A review of these laws and decisions can indicate what the Commission considers the appropriate balance between control and flexibility and enable us to determine whether the proposed project strikes an appropriate balance.

As noted above, § 701 grants the Commission broad authority to do things “necessary and convenient in the exercise” of the power to supervise and regulate public utilities, but § 451 requires that charges be “just and reasonable.” Section 740 specifically grants the Commission authority to fund research, and § 740.1 provides guidance on the objectives that “each project should also support.”

It is also notable that the statutory language itself recognizes the uncertainty of research. Section 740.1 asks that research projects “offer a reasonable probability of providing benefits to ratepayers” and that “expenditures on projects which have a low probability of success should be minimized.”

This language of the statute calls for the Commission to exercise a balanced judgment. The statutory language neither forbids nor requires the funding of research; the language sets no rigid requirements that a research project must meet.

A review of the Commission’s statutory authority and past Commission decisions makes clear that while the Commission has always exercised strict control over gross expenditures and ratemaking treatment that recovers the costs of a research project, it has varied greatly in the level of scrutiny it has given to specific research projects.

During many years, the Commission approved “EPRI dues,” granting much discretion to this organization. After 1996, pursuant to legislation

(Assembly Bill 1890 (1996)), ratepayers funded research, but the CEC exercised oversight concerning the major research projects, which the CEC conducted through its PIER program. The PIER program, until its funding expiration on January 1, 2012, received \$62,500,000 per year from ratepayers pursuant to § 399.8, but it was the CEC that provided the oversight.

In reviewing the pre-AB 1890 history of the Commission's funding of research, it is clear that the Commission can fund beneficial research without the elaborate governance and oversight that the parties have proposed in this application. At its heart, the relationship between PG&E, SCE, SDG&E and LLNL is not that different from that between the electric companies and EPRI, an organization that conducted research on behalf of electric companies, who paid dues and benefited from the results of the research. The CRADA, however, makes it possible for both the utilities and the Commission, through an advice letter review of the CRADA and proposed research projects, to exercise more oversight over this research than the research conducted by EPRI.

The central issues before us are whether the research program, as proposed or as modified pursuant to Commission direction, sets clear requirements concerning the 1) policies and criteria guiding the research program, 2) the funding levels and 3) ratemaking treatment. If these requirements are clear, then the three utilities and LLNL can write a CRADA that the Commission can review via an advice letter to ensure that ratepayers will benefit from its terms.

In reviewing the CES-21, both the funding (item 2) and the ratemaking treatment (item 3) are clear and a Commission decision approving these proposals provides direction to all three utilities concerning how to draft a conforming CRADA.

The critical issue that remains is whether Commission can set policies and criteria guiding the development of a CRADA and research projects conducted pursuant to the CRADA that would permit the Commission to determine that the CES-21 program meets the statutory requirements and guidelines pertaining to research through an advice letter review.

Before moving on, it is important to note that to the extent that the Commission itself reviews the CRADA and research projects through an advice letter process, as proposed in this decision, then the objections raised by TURN and DRA concerning “unlawful delegation” become moot. In an advice letter review process, the Commission does not delegate to an external entity the authority to approve either the terms of the CRADA or the portfolio of research projects. Instead, the Commission itself takes action to approve or reject the CRADA and proposed research.

5.2. Is the Proposed Project Reasonable? Should it be Modified in Any Way?

As discussed in the previous section, this decision must determine whether the Commission can set areas of research and set policies to guide the writing of the CRADA and guide the selection of research projects included in it. Specifically, can the Commission set contract requirements that assure that the CRADA and CES-21 projects are consistent with the guidelines set forth in § 740.1?

The Commission must also determine the reasonableness of the proposed funding levels and the reasonableness of the proposed changes in rates that will finance the research. If these conditions are all met, it will be lawful to fund the program and to delegate its administration.

5.2.1. Positions of Parties

TURN and DRA argue that the CES-21 project is deficient on numerous grounds.

TURN argues that the Joint Utilities “provided no detailed breakdown of the estimated spending, and no meaningful forecast of project costs that might permit the Commission to assess the reasonableness of the requested funding level.”⁹⁷ In particular, TURN argues that the “maximum funding level that the utilities have agreed to with LLNL is very different than a forecast of reasonable costs that the utilities might incur for the CES-21 Project.”⁹⁸ TURN argues further that:

Nowhere in the testimony do the utilities address, much less explain, how they reached this determination or why the Commission should find the resulting figure reasonable.⁹⁹

In a separate argument, TURN argues that the Joint Applicants “present no detail about internal utility administrative costs.”¹⁰⁰

TURN also argues against the choice of LLNL, stating that the Joint Utilities “failed to assess, much less explain, the reasonableness of treating LLNL as a ‘sole source’ provider.”¹⁰¹ In contrast, TURN argues that the utilities should have taken a different approach, stating:

⁹⁷ TURN Opening Brief at 4.

⁹⁸ *Id.* at 4.

⁹⁹ *Id.* at 5.

¹⁰⁰ *Id.* at 5.

¹⁰¹ *Id.* at 6.

Competitive solicitations are an important way to ensure that contracts for services are reasonable.¹⁰²

TURN concludes that “the level of due diligence the utilities performed here is not sufficient to warrant approval of the \$150 million of ratepayer funds.”¹⁰³

TURN further argues that the “Joint Utilities failed to present any projects in sufficient detail to permit the Commission to assess the reasonableness of the proposed funding level.”¹⁰⁴ TURN states:

The Joint Utilities fail to present any actual proposed projects that they might pursue through the CES-21 Project. Instead, the application and testimony merely describe “main areas” for projects – Cyber Security, Electric Resource Planning, and Electric and Gas System Operations – with “illustrative examples” of project activities that may (or may not) be undertaken and hypothesized benefits that may (or may not) occur.¹⁰⁵

TURN also argues that in addition to failing to present detailed projects, the “Joint Utilities fail to present an adequate showing on the potential benefits of cost-benefit analysis that might enable determining if the proposed costs are reasonable.”¹⁰⁶ TURN argues that the approach that the Joint Applicants propose does not compare with “the analysis presented in other applications seeking to establish a reasonable probability of benefiting customers” such as PG&E’s Compressed Air Energy Storage.”¹⁰⁷ In addition, TURN argues that the

¹⁰² *Id.* at 6.

¹⁰³ *Id.* at 10.

¹⁰⁴ *Id.* at 10.

¹⁰⁵ *Id.* at 10.

¹⁰⁶ *Id.* at 11.

¹⁰⁷ *Id.* at 14.

“calculations that accompany the Joint Utilities’ ‘illustrative’ examples do not provide the Commission with a basis for finding the CES-21 Project has a reasonable probability of benefiting customers.”¹⁰⁸

TURN therefore concludes that the utilities have “failed to provide the Commission with sufficient information to support a finding that spending up to \$150 million of this effort would result in utility rates that are ‘just and reasonable’”¹⁰⁹

DRA analyzes the CES-21 project against § 740.1 and argues that “the amended application fails to provide sufficient information for the Commission to find any reasonable probability of a benefit to ratepayers.”¹¹⁰ Specifically, DRA argues that:

The amended application does not provide a basis for allocating \$150 million in ratepayer funds to LLNL which results in the entire application having a low probability of success. The request fails to explain how it would be consistent with the IOUs’ resource plan. While the IOUs do present illustrative cases (that appear duplicative with other ongoing research) DRA noted in its Protest on November 2, 2011, that the “applicants fail to define deliverables, timing, milestones, decision-making authority and structures to ensure quality control and accountability, or any detailed information on costs. And the applicants failed to provide any of the supplemental information requested by the ALJ and the assigned Commissioner.” Though the IOUs attempt to fit their ideas into the objectives required under PU Code

¹⁰⁸ *Id.* at 15.

¹⁰⁹ *Id.* at 17.

¹¹⁰ DRA Opening Brief at 3.

§ 740.1(e), the blank check requested by the IOUs would not limit their research to those objectives.¹¹¹

DRA argues that since the application relies on illustrative cases and not a proposed project, “there is no basis upon which the Commission can find the application presents ‘a reasonable probability of providing benefits to ratepayers.’”¹¹² Furthermore, DRA argues that without “a detailed evaluation the Commission must find that the probability of success is non-existent, and well below that required by statute.”¹¹³ Similarly, DRA argues that without a detailed evaluation “the Commission cannot find the speculated research areas to be consistent with the utilities resource plans.”¹¹⁴

DRA argues that without research details, “the utilities are asking for a blank check.”¹¹⁵ DRA also objects to the governance process, arguing that it “allows each utility to act independently of the Board” by declining to participate in a research project.¹¹⁶

DRA also argues that the Joint Applicants have failed to show that “there is a need for the exceptional high-performance computing capability at LLNL.”¹¹⁷ DRA also claims that “the application does not explain why the research should

¹¹¹ *Id.* at 3.

¹¹² *Id.* at 4.

¹¹³ *Id.* at 6.

¹¹⁴ *Id.* at 8.

¹¹⁵ *Id.* at 10.

¹¹⁶ *Id.* at 14.

¹¹⁷ *Id.* at 16.

not be funded through the EPIC program or why the LLNL is the appropriate entity to perform the research.”¹¹⁸

DRA alleges that the requested funding “would duplicate the Commission’s initiatives in the LTPP proceeding”¹¹⁹ and that “the lack of controls or limits on research ... directly conflicts with the Legislative prohibition of funding for climate change research.”¹²⁰

Finally, DRA argues that the CES-21 would be a “program” and subject to the provisions of P.U. Code Section 326.5.

Concerning CES-21, the Joint Applicants argue that the projected costs are reasonable:

The \$30 million per year costs of CES-21 are reasonable, particularly in light of the Commission’s own findings that energy RD&D funding has fallen steadily since 1978, and that the current funding “gap” for California energy RD&D spending could be as much \$670 million per year. The \$30 million in annual costs are spread across the service areas of all three of the Joint Utilities, further reducing the costs to customers.¹²¹

Thus, the Joint Applicants argue the reasonableness of both the level of funding and the proposed mechanism for financing the research proposal.

The Joint Applicants also argue that the CES-21 project meets the criteria set forth in the § 701.1 guidelines. Specifically, the Joint Applicants note that the proposal avoids duplication, clearly sets the funding amounts and allocation to

¹¹⁸ *Id.* at 17.

¹¹⁹ *Id.* at 21.

¹²⁰ *Id.* at 21.

¹²¹ Joint Applicants Opening Brief at 2.

projects and the funding mechanisms and complies with the principles in § 740.1 and § 8360.

The Joint Applicants argue that the proposed project is beneficial and necessary because:

First, the sheer volume of data the IOUs are confronting is dramatically increasing. For example, just taking into account the IOUs Advanced Metering Infrastructure projects, the amount and quality of granular energy usage data available to be analyzed and used for utility operational improvements and customer-facing energy management programs has increased several orders of magnitude, from 20 million customers with only 12 data points of energy usage per year, to the same number of customers with 35,040 data points per customer per year. Second, as acknowledged by numerous studies and reports on energy and environmental issues in California, the complexity of issues confronted by California energy utilities, customers and policymakers today is also increasing.¹²²

In addition, the Joint Applicants argue that the high power computing of LLNL will “reduce the time to run simulations and thus help the IOUs be more responsive to the demands of today’s business and regulators.”¹²³ Specifically, they argue that the research will help the Joint Applicants better understand complex issues of grid management and will reduce costs.

Concerning the choice of LLNL, the research partner, the Joint Applicants argue that:

LLNL’s capabilities are well-known and globally recognized. LLNL is a premier applied science laboratory within the United States Department of Energy (DOE). Since its founding in 1952,

¹²² *Id.* at 6-7.

¹²³ *Id.* at 7.

LLNL has consistently provided groundbreaking solutions for its customers in a broad range of national security missions.¹²⁴

The Joint Applicants state that the research program has four elements, “electric resource planning, electric systems operations, gas system operations and cyber-security.”¹²⁵ The applicants then describe the current research issues in each area and the goals of the proposed research.

For electric resource planning, the Joint Applicants identify the limitations of current system models and how they fail to reflect the “complexity of the electric grid”¹²⁶ and computational bottlenecks. The Joint Applicants state that an initial goal is to develop “improvements to optimization algorithms and the application of high-performance computing.”¹²⁷ The Joint Applicants discuss potential modeling projects, and estimate that refinements in the estimates of “load following requirements” would lead to a benefit of “\$30 million/year.”¹²⁸ In addition, by improving the estimate of “resource need for renewable integration,” the project would provide a benefit of “\$552 million.”¹²⁹

In Reply to the arguments of TURN and DRA, the Joint Applicants argue that:

[T]he scope of the CES-21 RD&D collaboration is innovative and extraordinary, and the governance of the CES-21 program will provide the Commission, utility customers and California

¹²⁴ *Id.* at 8.

¹²⁵ *Id.* at 11.

¹²⁶ *Id.* at 11.

¹²⁷ *Id.*

¹²⁸ *Id.* at 14.

¹²⁹ *Id.* at 14.

policymakers with effective and extensive authority to ensure that CES-21 funding is spent wisely, prudently and for the clear benefit of utility customers and California.¹³⁰

More specifically, concerning the absence of detail on specific projects and costs, the Joint Applicants respond:

Contrary to TURN and DRA, it [the absence of detail] is a positive virtue, not defect, of CES-21 that the Joint Utilities have provided details in this proceeding on potential and illustrative projects, but have deferred review and final approval of the actual projects to the collaborative and inclusive governing process proposed for CES-21. The whole purpose of CES-21 is to establish an unprecedented, extraordinary energy RD&D collaboration in California, instead of relying on 12-18 month, project-by-project, approvals of RD&D expenditures.¹³¹

The Joint Applicants point out that “CES-21 includes formal criteria for approval of specific projects similar to the criteria adopted by the Commission for investment projects under EPIC.”¹³² Specifically, the Joint Applicants argue that:

The CES-21 criteria also meets and exceeds the Section 740.1 criteria, including requirements that CES-21 projects demonstrate a reasonable probability of success, avoid duplication, and be consistent with the Joint Utilities’ resource plans and California energy and environmental goals.¹³³

The Joint Applicants point out the review criteria that, when adopted by the Commission, will apply to the business case reviews that the board will require for each project.

¹³⁰ Joint Applicants Reply Brief at 2.

¹³¹ *Id.* at 3.

¹³² *Id.* at 4.

The Joint Applicants argue the illustrative use cases provide detail on specific and potential projects and that TURN and DRA fail to discuss the technical details of the projects. The Joint Applicants note that “the ALJ in the hearings engaged the witnesses ... in a discussion of the detailed examples of the specific types of projects they would request for initial consideration and evaluation by the CES-21 board.”¹³⁴ The Joint Applicants state that this on-the-record discussion explored how the high-performance computing could be used to improve models of the electric and gas systems and the benefits it would yield.¹³⁵

In reply, the Joint Applicants also argue that LLNL will not be a “sole source” provider of RD&D because the “CES-21 governing board will consider services from RD&D providers other than LLNL.”¹³⁶

The Joint Applicants also argue in reply that the CES-21 does not provide a “blank check.” The Joint Applicants argue:

[T]he CES-21 governance process actually provides the Commission with a greater, more direct oversight role than it has played in the past on utility RD&D expenditures. In both the EPIC proceeding and in the utilities’ General Rate Cases, the Commission has approved budgets for energy RD&D that are subject to broad guidance and principles on utility-funded RD&D programs, while leaving the project-by-project decisions and

¹³³ *Id.* at 4, footnote 11.

¹³⁴ *Id.* at 5.

¹³⁵ *Id.* at 6-9.

¹³⁶ *Id.* at 10.

expenditures to the individual utilities or providers (such as the Energy Commission).¹³⁷

In addition, the Joint Applicants argue:

The reality is that, vote or no vote [on the Board of Directors], the Commission will have a “de facto” veto over CES-21 decisions and expenditures, because it always retains the ability to audit, investigate or directly modify the utilities’ rates and funding for CES-21.¹³⁸

Finally, the Joint Applicants argue that the AB 1338 does not prohibit the funding of research and that “the scope of the RD&D proposed for CES-21 does not include ‘climate change research,’ and so the prohibition in AB 1338 is inapplicable to CES-21 on its facts.”¹³⁹

5.2.2. Discussion: With Amendments, the CES-21 Research Project is Beneficial to Customers, and Reasonable to Fund; Tier 3 Advice Letters Enable the Commission to Ensure Beneficial Results

The evidence provided in the record of this proceeding makes clear that the CES-21 research project will likely provide substantial benefits to California ratepayers including economic savings, improved safety and operational reliability, and improved cyber security practices that will both improve operational security and the protection of privacy. In addition, the CES-21 project, when viewed as an application seeking authority to enter into a CRADA with LLNL, is both consistent with law and past Commission practices.

¹³⁷ *Id.* at 12-13.

¹³⁸ *Id.* at 13.

¹³⁹ *Id.* at 18.

Following the procedures used by the Commission in past proceedings, this decision adopts guidelines to shape the CRADA and sets forth criteria for the staff's review of a Tier 3 advice letter proposing specific research projects and research budgets. These criteria, pursuant to a Tier 3 advice letter review process, will guide Commission staff in the preparation of resolutions for consideration by the Commissioners at a Commission meeting that will resolve any issues raised by the specific terms of the CRADA and the research proposals contained in it. A Tier 3 review process ensures consideration of matters pertaining to the important CES-21 research proposal at the highest level of the Commission.

5.2.2.1. CRADA Guideline 1: The CRADA Should Restrict Research Projects to Four Promising Areas

The evidence presented in this proceeding demonstrates that a CES-21 research project, if limited to the areas of cyber security, electric resource planning, and electric and gas system operations, would likely provide substantial benefits to California ratepayers.

Concerning gas operations and the modeling of transmission and distribution, the cross-examination of utility Witness Wong made clear that the current process for modeling the gas system is very limited. In particular, it requires that the analyst input valve settings to model system flows because the model lacked the ability to model and optimize operations over the range of valve settings.

ALJ SULLIVAN: From what you are saying is that the algorithm that you use cannot choose the optimal setting by itself. So you just - so what you do is you choose one feasible setting and then change the settings around?

WITNESS WONG: That's correct.

ALJ SULLIVAN: That sounds pretty limited to me.

WITNESS WONG: The optimization routine we use has limitations, kind of like you mentioned. So we do have to -- try settings on your own, try different settings on our own.¹⁴⁰

Further questioning sought to explore the number of valve settings that a complete modeling of gas operations would require.

ALJ SULLIVAN: I assume it is a factorial type of analysis?

WITNESS WONG: Yes.

ALJ SULLIVAN: And so how many valves, and what are the number of potential? I mean are we talking millions?

WITNESS WONG: Well, for the number of valves for example on our backbone system, we have cross ties between our main backbone lines. If you want to try different combinations of those cross ties, I would say we probably have 10 to 20 on our system. If you want to try every combination of those, I believe it is 2 to the 10.

"2 to the 10" is 1024, so there would be over 1000 computer runs to perform to ensure that the optimal valve settings on the backbone transmission system.

Upon further cross-examination Witness Wong testified that with a more comprehensive model and with faster computing, gas operations could improve in several ways: 1) less gas would be needed to maintain flow pressures, and this would be both safer and more efficient;¹⁴¹ 2) it would easier to detect leaks;¹⁴² 3) estimates on the miles of pipes needed to meet a need would improve.¹⁴³

¹⁴⁰ TR at 179.

¹⁴¹ TR at 242.

In addition, as noted previously, cross examination of the LLNL witness made it clear that advanced computing will enable gas operations to model “how different flow control devices turn on and off and how that might affect pressure within the lines” and will “interrogate the physics” to determine “what does it take for a pipe to break as a function of, say, the soil it’s in.”¹⁴⁴

The Joint Applicants in their opening brief argued that a one percent improvement in gas modeling efficiencies would save \$1.75 million per year, or \$8.75 million over five years, as well as improve safety, which was not given a dollar value.

The area of electric resource planning was also revealed as one in which improved modeling would provide substantial monetary savings. Cross-examination by the ALJ determined that current electric resource planning lacks “an algorithm that can optimize over so many variables”¹⁴⁵ and that currently it takes “a day” to run a model simulation.¹⁴⁶ The witness testified that the CES-21 could save \$30 million per year in reduced load following costs and \$552 million in reduced resources needed to integrate renewable resources.¹⁴⁷

In the area of electric system operations, the data generated by Smart Meters can improve distribution planning and the integration of renewables. The vast quantities of data, however, have a real impact on utility planning, and the

¹⁴² TR at 243.

¹⁴³ TR at 187-188.

¹⁴⁴ TR at 124.

¹⁴⁵ Joint Applicants Reply Brief at 7.

¹⁴⁶ *Id.* at 8.

¹⁴⁷ Joint Applicants Opening Brief at 14.

witness from LLNL made clear the implications of the explosive increase in data generated by Smart Meters:

ALJ SULLIVANCould this be done outside of -- is it possible to do this outside of a high-performance computing lab, or just not really -- just so operationally too slow?

WITNESS DR. FRIEDMANN: The 20 million smart meters in the State of California in 2014 will generate about 3 terabytes of data a day, which is about a Library of Congress worth of data every day. You simply need a very large computing capability both in terms of speed and bandwidth to be able to handle that. To my knowledge there are not other computational resources in the state that can actually manage that.¹⁴⁸

In the area of cyber security, a utility witness testified to the benefits that would likely arise from collaboration with LLNL:

WITNESS MIKOVITZ: And so when I heard about Lawrence Livermore's capabilities and especially the work that they had done on simulating nuclear weapons testing results, that was incredibly compelling to me personally. It was compelling because on one hand, the need for sensitivity in a national security context told me that they were the kind of partner that would make sense.

The second thing that was compelling to me is in talking to my colleagues, it appears at the other IOUs --we all recognize that there were long-term challenges that were going to be difficult to deal with at scale. And so computer simulations in terms of understanding those problems and understanding ways of potentially solving those became very compelling. That's why we used a use case in the application that was basically centered about threat -- threat modeling.¹⁴⁹

¹⁴⁸ TR at 130.

¹⁴⁹ TR at 245-246.

The witness testified how these capabilities could be used to improve security throughout utility operations:

WITNESS MIKOVITZ: What would be different about that project is -- about the potential types of research projects that this program funding approach would open up the opportunity for is the ability to model in -- in the -- simulate, if you will, our technical environment and understand which areas of weaknesses are most likely to have the most significant negative impacts to reliability, to customer service, to operational capabilities, and, therefore, further optimize our focus on a -- we're always going to have a finite set of resources and we always want to be focusing our finite set of resources on the things that are most valuable.¹⁵⁰

With these illustrative examples, the record makes clear that research projects that exploit the advanced computing and security capabilities of LLNL in the areas of Cyber Security, Electric Resource Planning and Electric System Operations, and Gas System Operations are highly likely to produce substantial benefits to ratepayers. Thus, research projects limited to these areas will be consistent with the guideline contained in § 740.1(a).

In addition, since projects limited to these four areas are most likely to be successful, this limitation will minimize expenditures on projects with a low probability of success.¹⁵¹ As a result, research projects limited to these areas will be consistent with the guideline contained in § 740.1(b).

¹⁵⁰ TR at 247-248.

¹⁵¹ See § 740.1(b).

Projects limited to these four areas are consistent with the corporation's resource plan¹⁵² since they all support basic company operations in transmission, distribution, electric grid planning and/or security.

Projects in these four areas are highly likely to improve operating efficiency and reliability because the typical use of optimization techniques is to improve operating efficiencies and to improve reliability by identifying weaknesses in electric and gas distribution systems, by more accurately modeling electricity resource needs, and by improving cyber security practices.¹⁵³

For this reason, the Commission adopts as a requirement for CES-21 that the CRADA must limit research projects to the areas of Cyber Security, Electric Resource Planning and Electric System Operations and Gas System Operations

**5.2.2.2. CRADA Guideline Two: The CRADA Shall
Limit Yearly and Total Expenditures**

The decision finds that the \$150 million -- \$152.19 million including Franchise Fees and Uncollectibles -- is a reasonable level for five-year funding because this level of funding provides for long-term, sustainable and stable funding for the research and other activities conducted under the project during its five years. In addition, the \$150 million in research costs is dwarfed by the potential economic benefits that will likely exceed \$500 million.¹⁵⁴ Moreover, the selection criteria for projects ensure that the projected benefits of specific projects will exceed the research costs for each of the funded benefits.

¹⁵² See § 740.1(c).

¹⁵³ See § 740.1(e)(5).

¹⁵⁴ Joint Applicants Opening Brief at 14 shows that improving the estimate of resources needed for renewable integration can reduce the need for gas fired capacity by \$552 million alone.

In addition, it is reasonable to limit the expenditure of funds in any one year to \$30 million, as proposed by the Joint Applicants. When this is done, the CRADA will provide a stable source of funding for a five-year period.

**5.2.2.3. CRADA Guideline Three: Implementing
Advice Letters Shall Allocate and Recover
Costs Consistent with the Cost Allocation
and Recovery Proposals**

It is also reasonable to allocate the funding of the projects as proposed among PG&E, SCE, and SDG&E, with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs. Concerning ratemaking treatment for PG&E, since the projects will include both electric and gas operations, it is reasonable to allocate 75% of PG&E's costs to electric distribution and recover the costs through the Distribution Revenue Adjustment Mechanism. Gas revenue requirements can reasonably be recovered through the Core Fixed Cost Account for core gas customers and the Noncore Customer Class Charge Account for noncore customers.

Concerning ratemaking treatment for SCE, it is reasonable for SCE to recover its CES-21 costs through the Base Revenue Requirement Balancing Account, and SCE may book its CES-21 costs into that account for cost recovery.

SDG&E proposes to open a balancing account to record the difference between its share of the program expenses, as described in the section on SDG&E's CES-21 Revenue Requirements in Exhibit U-1, up to the maximum, and its annual revenue requirement. The ultimate disposition of this account would be addressed at SDG&E's annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers. This proposed ratemaking treatment for the recovery of SDG&E's CES-21 costs is reasonable.

**5.2.2.4. CRADA Guideline Four: Research Projects
Conducted Under the CRADA Must Meet
Specific Criteria**

Because of the nature of the proposed research and because of the evolving nature of generation, transmission and communications technologies and issues, it would be unreasonable to require a detailed description of proposed projects at this time. When questioned on this point, the witness from LLNL stated:

DR. FRIEDMANN: If I can speak to that a little bit. We have continued to work with the technical teams at the IOUs to understand more richly what their business needs are so that we can come up with projects that look viable. One of the things we have learned in the past two years is what was highest priority two years ago is not necessarily the highest priority now. That is part of the basis by which we provided illustrative cases in our application. We didn't want to converge quickly on an answer which in two years was no longer the important question. So we wanted to remain flexible across a wide set of potential solutions. But in call [sic] cases, like the one we just went through now [with] you, [we] would want to understand what the need is, what the deliverables are and what milestones you need to get there.¹⁵⁵

The Joint Applicants point out that, as proposed, the Board of Directors will review projects and as part of the approval process will map planned investments to the electric system value chain, allocate funds from the overall amount approved to specific projects, analyze the justifications for funding the proposed project, and review the project to ensure that it avoids duplication of research. The Board of Directors will also assess the projects' predicted and

¹⁵⁵ TR at 129.

actual performance against costs and benefits to ratepayers and to the state, including energy cost savings, economic benefits, and environmental benefits.¹⁵⁶

5.2.2.5. Project Criterion 1: Research must not exceed \$30 million in any year

It is reasonable to require that the cost of research projects conducted under CRADA in any given year shall not exceed \$30 million.

Our review of the record in this proceeding leads us to conclude that the proposed \$30 million of annual funding for five years is reasonable in light of the Commission's findings that energy RD&D funding has fallen steadily since 1978 and that the current funding gap for California energy RD&D could be as much as \$670 million per year.¹⁵⁷

5.2.2.6. Project Criterion 2: Research must fall into the four approved areas

In addition, each research project conducted under the CRADA should demonstrate that it falls into one of the four areas approved for research. In addition to being a "guideline" for the writing of the CRADA, the restriction of research to the four areas (gas operations, electric operations, electric resource planning and cyber security) is a criterion that each research proposal must meet.

¹⁵⁶ Joint Applicants Opening Brief at 203.

¹⁵⁷ *Electric Program Investment Charge, Staff Proposal*, February 10, 2012, Rulemaking (R.) 11-10-003, at 9- 10, 17; D.12-05-037, *Phase 2 Decision Establishing Purposes and Governance for Electric Program Investment Charge and Establishing Funding Collections for 2013- 2020*, May 24, 2012, at 6.

**5.2.2.7. Project Criterion 3: Research Proposals
Must Have Support of Majority of Board of Directors
and Provide an Explanation if Not Funded
by All Utilities**

This decision envisions a research program guided by the CES-21 Board of Directors, with their judgment subject to the review of the Commission. For this reason, all advice letters seeking approval of proposed research projects should report the vote of the CES-21 Board of Directors to the Commission. The Commission will review the advice letter filing and will only approve projects that have the support of a majority of the Board.

In addition, if one or more utility declines to support the financing of the project, the advice letter should explain the reason.

**5.2.2.8. Project Criterion 4: The Business Case
analysis for a proposed research shall
demonstrate the projected benefits
exceed projected costs and the research
is not duplicative**

The decision requires the preparation of a “business case” for each research project. The “business case” shall demonstrate, among other things, that benefits to ratepayers exceed costs to ratepayers and that the research does not duplicate other research conducted by the utilities.

In making the assessment of costs and benefits, all costs and economic benefits (such as cost savings) should be discounted to a net present value following standard procedures used by the Commission (for example, such as those used to calculate the Market Price Referent).

If a research proposal produces benefits that are not strictly economic, such as improvements in safety, reliability, or cyber security, staff shall not reject such an advice letter filing. If there is no prior Commission-established methodology for monetizing benefits, then Commission staff should address this issue in the

resolution proposed for consideration by the Commission, pursuant to the Tier 3 process. This decision takes this approach because the Commission wishes to encourage research on safety, reliability and cyber security, as well as on cost savings and therefore this decision rejects an approach that disadvantage or delay this type of research. The Commission does not want to impose a higher procedural hurdle, such as that engendered by an application, on projects that produce cyber security, safety and reliability. Moreover, a Tier 3 advice letter process is well suited to the resolution of such matters by the Commission, since this decision authorizes research in this area¹⁵⁸ and in some cases, the methodology for assessing these benefits “does not flow directly from the statute or Commission order.”¹⁵⁹

As discussed in the application, the business case will also include information on research milestones, project timelines, administrative structure, and anticipated products. Moreover, the business case, as contained in the advice letter, should discuss the following for each project:

1. What is the overall value of the results from the potential research to ratepayers and to the utility system's safety and reliability?
2. How do the costs of the research compare to potential benefits?
3. Would the results of the research have an impact on the ability of the grid to support the competitive provision of electric power or on the ability to integrate non-utility assets and distributed generation onto the grid?

¹⁵⁸ General Order 96-B, General Rules, 5.1, Matters Appropriate to Advice Letters.

¹⁵⁹ General Order 96-B, Energy Industry, Industry Rule 5.3, Matters Appropriate to Tier 3, part (2).

4. Does the proposed research align with CPUC policies? Does it, for example, support, specific programs such as the Commission's, 33% renewable goal by 2020, and Gas Pipeline Safety plans?
5. Does the proposed research produce specific benefits concerning utility resources including transmission, distribution, generation, system operations, management, and oversight?
6. Does the research help foster safe, reliable service at just and reasonable costs?

These questions should be addressed in the business case for projects in each of the four areas of research -- electric system operations, electric resource planning, gas system operations and cyber security. In addition, the advice letter should discuss how the portfolio of projects in a given year is consistent with the Commission's research goals, as set forth in § 740.1.

The Advice Letter should also contain:

1. A proposed project description, including goals, methodology, milestones, and resources needed
2. A discussion of the alternative sources of expertise that were considered for a project, as proposed by the Joint Applicants in their description of the CES-21 project contained in Ex. U-2 at 4-5.

Concerning a showing that the proposed research does not duplicate other research efforts, the advice letter should demonstrate that the proposed research does not duplicate research being conducted elsewhere by California utilities, by EPRI, by the CEC and by the DOE.

Coordination of efforts undertaken under the CES-21 initiative and corresponding CRADA with other research initiatives will be critical to ensure that activities funded are not duplicative and ensure that CES-21 activities

leverage research conducted elsewhere. This coordination will help maximize the value these various research efforts provide to ratepayers. For example, in D.12-05-037, the Commission established the Electric Program Investment Charge (EPIC), specifically to fund emerging clean energy technologies, as well as to support efforts to improve the tools available to policy makers and regulators to enable effective grid operations recognizing the availability of new technologies and the profound operational implications of shifting toward an increasingly low emission and distributed energy system. Absent effective coordination, CES-21 activities could be duplicative of some of the activities that might be pursued under the EPIC program.

In network industries, such as electric and gas distribution, one thing is always related to another, and it is critical to ensure research does not overlap. Therefore, it is incumbent upon the Joint Applicants, when filing their Tie 3 Advice Letter, to explain clearly how the activities they propose to undertake under CES-21 CRADA are related to activities undertaken through other research programs, including, but not necessarily limited to EPIC. We also expect Energy Division staff, when reviewing this Advice Letter, assess whether the proposed activities are reasonable given efforts undertaken in other research programs.

**5.2.3. The Commission Will Review CRADA
and Proposed Research Projects Each
Year via a Tier 3 Advice Letter**

To ensure that these policies are followed in both the drafting of the CRADA and in the selection of research projects, this decision requires that the Joint Applicants file the CRADA and research projects with the Commission as a Tier 3 advice letter, one for each of the five years of the CES-21 Project. In addition, the CES-21 Project's Board of Directors must conduct a public workshop, including the California Public Utilities Commission, to discuss the

proposed research and priorities and to review the business case for proposed research. This public workshop should be held at least 45 days before the submission of each Tier 3 advice letter. In the first year, the Joint Applicants should file a Tier 3 advice letter to enable the Commission to review the CRADA and initial research projects, which will be included in the CRADA, to determine its consistency with the guidelines and criteria adopted in this decision. For each subsequent year, the Joint Applicants should file a Tier 3 advice letter with the projects that will be conducted under the CRADA in the upcoming year or years. As was done in the first year, the Commission will review the CRADA and the projects to determine its consistency with the guidelines adopted in this decision.

The Joint Applicants note that under the proposed CRADA, a research project can be terminated upon a 30-day notice. If the advice letter review results in a Commission resolution rejecting a proposed research project, then the utility shall not be entitled to recover monies expended on the rejected project.¹⁶⁰ If the approval of an annual advice letter is, however, delayed, then expenditures on projects approved in a prior year may continue as long as the expenditures are consistent with the budget included in the prior advice letter filing adopted for a specific research project. In particular, it is possible through the Tier 3 advice letter review for the Commission to approve projects that have a duration of more than one year.

Energy Division shall review the Tier 3 Advice Letter to ensure that the submittal contains the contents required in Ordering Paragraph 12 and shall prepare a Resolution that recommends disposition of the joint utility filing.

¹⁶⁰ Note: we include this discussion for clarity. In general, no money can be recovered on any project prior to approval.

**5.2.4. Since the Commission Reviews Projects
in Tier 3 Advice Letter Filings, Direct Commission
Participation on CES-21 Board is Not Needed**

Since the CRADA is a proposed research project and the contract is not dissimilar to other research projects conducted in the past by research groups working for the utilities, this decision sees no need for Commission participation in a governance structure as the applicants propose (and which TURN and DRA contend raises an issue of unlawful delegation). The CES-21 is not a Commission-initiated project like EPIC. The governance structure of EPIC was developed to provide oversight for *Commission-initiated* project. This research project is a *utility-initiated* project such as those commonly reviewed by the Commission through decisions and advice letters. Therefore, a governance structure – with Commission participation on the Board – is not needed.

The Commission, however, will create a liaison to the CES-21 Board to ensure smooth interaction between the research project and Commission reviewers. This decision therefore orders that the Director of the Commission's Energy Division or the Director's designee shall serve as a liaison to the Board of Directors. Although the liaison will not vote or be a member of the Board of Directors, the liaison can communicate Commission concerns to the Board, particularly those concerns pertaining to the information that the Commission needs to conduct a timely review of the annual Tier 3 advice letters.

**5.2.4.1. CRADA Guideline Five: The Board
of Directors Shall Number Six with
Three Members Chosen From Academia
or Research Institutes**

Concerning the governance structure of the Board of Directors for CES-21, this decision finds it reasonable to expand and modify the Board of Directors to insure participation at the governance level by those involved in research as

conducted by universities and research institutes. The decision therefore requires six directors, consisting of three directors, one chosen by each of PG&E, SCE, and SDG&E, and three directors, chosen by the utilities, who have experience in research institutes or academic departments relevant to the research proposals. This decision finds that the expansion of the Board of Directors is warranted by the more basic nature of the research proposed in this project. Research as proposed in the CES-21 falls outside the “applied research” that utilities have more commonly conducted and the Commission has more commonly funded. In light of these factors, this decision finds that it is prudent to increase the number of directors with experience in either research institutes or academic research tied to the four areas chosen for CES-21 projects.

5.3. If Modified to Be Consistent with Adopted Policies then CRADA and the CES-21 Program Should Be Authorized

As a result of these actions, this decision has set the policies to guide the writing of a CRADA contract for the CES-21 program, determined a reasonable level of funding for the CES-21 project, and determined a reasonable way to allocate the costs over the three utilities and set regulatory mechanisms for recovering costs.

The initial CRADA contract will be reviewed through the filing of a Tier 3 advice letter to ensure that it meets the guidelines adopted in this decision. In addition, the Joint Applicants will file annually a Tier 3 advice letter to demonstrate that the projects to be initiated in the next year under the CRADA meet the guidelines adopted in this decision and that overall expenditures fall within the yearly cap. In summary, the proposed CES-21 project will likely provide benefits to ratepayers that exceed its costs. It is reasonable to restrict the

research projects to four areas: Electric Operations, Gas Operations, Electric Resource Planning, and Cyber security.

This decision has also adopted policy criteria to guide the CES-21 Board of Directors in its review of projects and required an annual advice letter filing by Joint Applicants to enable Commission review of proposed research activities. In addition, the decision changes the composition of the board, increasing the number of board members to six and requiring the appointment of three board members with experience in research institutes or academic research, in addition to three members, one chosen by each utility. The decision also limited the funding for CES-21 to \$30 million per year for five years, allocated the cost responsibility to each utility and adopted a procedure whereby the utility could recover the costs. Furthermore, the Commission grants the Joint Applicants the authority to recover the costs of the CES-21 project upon the approval of the Tier 3 advice letter demonstrating that the CRADA and the research projects conform to the guidelines adopted in this decision. If a multi-year research project was approved in a prior advice letter and the project remains unchanged, then the funding of that approved research project can continue even if there is a delay in Commission action on a subsequent annual advice letter. No new research projects, however, should be initiated prior to Commission resolution of the advice letter (either through staff disposition or via a resolution voted at a Commission meeting).

In addition, the CES-21 governance process shall require that meetings of the Board of Directors be open to the public and subject to public access in the same way as meetings of other California public agencies, as proposed in the application. Prior to expending any funds authorized by this decision, the Joint Applicants and LLNL will negotiate and enter into a CRADA consistent with the

terms authorized in this decision. This CRADA shall be subject to approval by the Board of Directors for the CES-21 and subject to Commission review for compliance with this decision via a Tier 3 Advice Letter filed by Joint Applicants.

The Commission recognizes that the services provided by LLNL under the CRADA, which will be a five-year agreement, will be subject to the standards set under the CRADA and U.S. DOE regulations for CRADAs, including the right of the Joint Utilities and the Board of Directors of CES-21 to perform audits of LLNL's performance and to withhold payments for non-performance or default on a specific work order, as provided under CRADA regulations.

Also, as proposed by the Joint Applicants, the CES-21 Board of Directors will approve the scope of work and administration of the specific research projects funded by CES-21 and shall ensure that the work comports with the policies set in this decision. As noted above, the Joint Applicants shall file the proposed scope of work each year as a Tier 3 advice letter for approval by the Commission using the guidelines adopted in this decision.

The Board of Directors also will have the authority to select an executive director and staff recommended by LLNL to manage the project activities, and may appoint such technical and advisory committees as it deems appropriate to assist in the project activities. In addition, as proposed by the Joint Applicants, the Board of Directors will approve a strategic plan, annual budgets, and allocation of staff and other resources to provide services under individual work orders requested by each utility (or jointly) and the proportional share of funding set forth in the Proposal. These shall be provided to the Commission on an informational basis.

The Board of Directors will not have the authority to approve any new commitments or expenditures extending beyond the five-year term of the

CRADA, or beyond the authority granted in this Application. All funding of projects to support the work orders, including procurement of equipment, facilities, tools, computer software and hardware, will be subject to approval by the Board of Directors.

The Board of Directors shall provide an annual report to the Commission's Executive Director. The annual report should provide a detailed account of expenditures over the last year, the results of the research, the steps taken to involve academics or third parties in the research. In addition, the report should highlight the intellectual property, copyrights, or patents, that have resulted from the research.

6. Other Objections to the CES-21 Project

In addition to objections to the reasonableness and lawfulness of the CES-21 Project discussed above, TURN and DRA also raised other objections that warrant discussion.

TURN argues against the choice of LLNL and asks for a competitive solicitation for the contract.

This argument is not persuasive. In particular, it treats an effort to initiate research as if research were little more than an effort to purchase the standard products or services offered by many companies. A research project, to succeed, must be built upon a collaborative effort matching the needs of the funders with the capabilities and interests of those conducting research. As the evidence in the record makes clear, the current proposal represents substantial efforts on the part of the Joint Applicants and LLNL in this regard.

In addition, the Joint Applicants provide testimony concerning the unique resources, expertise and qualifications of the research personnel associated with LLNL.¹⁶¹ Such unique capabilities and their unique uses in this proposed research make the objection to the choice of LLNL and the request of a “competitive solicitation” unpersuasive.

TURN also objected to the applications use of “illustrative examples” rather than specific and detailed projects, arguing that this approach fails to enable the Commission to determine “if the proposed costs are reasonable.”¹⁶²

As noted above, the nature of basic research and the changing nature of energy priorities make the use and reliance on the “illustrative examples” a reasonable way to proceed. This decision uses these illustrative examples to set policy direction, limiting the research to the four policy areas for which the illustrative examples indicate will produce research leading to benefits. In addition, the decision requires that the Board review projects to ensure that the “business case” for each research project produces benefits for ratepayers and assesses specific projects against the guidelines in § 704.1. Moreover, the Commission’s review of the Joint Applicants’ annual advice letter filings, which will include details on each project and its projected benefits, enables the Commission to ensure that administrators follow the guidance given. In addition, the Commission’s review of the Board of Director’s annual report provides another opportunity for the Commission to monitor compliance with this decision.

¹⁶¹ Ex. U-3 at 2-1 to 2-8.

¹⁶² TURN Opening Brief at 11.

DRA also objected to the applicants' failure "to define deliverables, timing, milestones, decision-making authority and structures to ensure quality control and accountability, or any detailed information on costs."¹⁶³

This comment indicates a misunderstanding of the nature of the research project. At this preliminary stage, it is not possible to define deliverables, timing and milestones. Moreover, pursuant to the guidance given to the Board of Directors, the Commission will receive both the "business case" analysis presented to the Board of Directors and forwarded to the Commission as part of the Board's Annual Report. The "business case" analysis will also be in the annual advice letter filings filed with the Commission. This should provide the information that DRA desires. This analysis will provide the Commission with a basis for ensuring that the CES-21 project will follow the policies requiring the funding of only productive research projects.

DRA also specifically objected to the need for "the exceptional high-performance computing capability at LLNL."¹⁶⁴ In response, the record of the proceeding is clear that these capabilities are needed to model gas and electric operations, to optimize the integration of intermittent renewables into the grid, improve load management, and to handle the three terabytes of data generated daily by the Smart Meters.

Finally, DRA's argument that CES-21 is a "program" and subject to the provisions of § 326.5 is not an issue that the Commission need address in this decision. Section 326.5 imposes reporting requirements on the *Commission*, not

¹⁶³ DRA Opening Brief at 3.

¹⁶⁴ *Id.* at 16.

on project applicants. For that reason, there is nothing that the Commission need order the applicants to do at this time.

7. Articulation of State Policy Pertaining to CES-21

The Commission here approves the coordinated efforts of PG&E, SCE and SDG&E to enter a CRADA with the LLNL for the CES-21 research project. In doing so, the Commission is promoting one of the cornerstones of California's energy policy, that of continuing ratepayer-funded research and development that ensures the continued safe, reliable, affordable, and environmentally sustainable electric service.

Specifically, the CES-21 research project is intended to pool the three large California electric IOUs' experience, expertise, and resources to address some of the most challenging problems they are facing: integrating intermittent energy from renewable resources into their supply portfolios while ensuring reliable service, improving electric and gas operations, combating cybersecurity threats, and processing unprecedented amounts of data from smart meters using LLNL's supercomputing capabilities. Pooling the resources – and ratepayer funds – of the three large California electric IOUs maximizes the likelihood of successful R&D. Indeed, pooling IOU resources is warranted and prudent, because of both the complexity and interdependence of the electrical systems in California and the magnitude of cost to undertake the research and development to address these 21st century challenges.

8. State Action Immunity

It is the Commission's intention that the three IOUs, by virtue of entering into the CRADA, and funding research activities by LLNL in accordance with the subject agreement, will be doing so in furtherance of state policy and under the direction and continuing supervision by, and ultimate control of, this

Commission, sufficient to confer immunity from antitrust liability under the State Action Doctrine.

As this Commission has explained in a prior decision authorizing these same IOUs to participate in a commercial negotiation over a joint power purchase agreement, the State Action Doctrine affords private entities protection from antitrust liability when they act pursuant to state policy and under the active supervision of an agency such as this Commission. (See D.10-06-009 at 8-9.) The Commission there explained:

“Private party conduct is immune from antitrust liability only if the party claiming immunity shows that its conduct satisfies two requirements. First, it must be ‘clearly articulated and affirmatively expressed as state policy.’ [*California Retail Liquor Dealers Ass’n v. Midcal Aluminum*, 445 U.S. 97, 105, 100 S.Ct. 937, 63 L.Ed.2d 233 (1980)(*Midcal*)] (internal quotation marks omitted.) This may be satisfied if the conduct is a ‘forseeable result’ of the state’s policy. *Town of Hallie v. City of Eau Claire*, 471 U.S. 34, 38-39, 42, 105 S.Ct. 1713, 1716-17, 1718, 85 L.Ed.2d 24 (1985). Second, the conduct must be ‘actively supervised by the State itself.’ *Midcal*, 445 U.S. at 105, 100 S.Ct. at 943 (internal quotation marks omitted). This is satisfied only if ‘state officials have and exercise power to review particular anticompetitive acts of private parties and disapprove those that fail to accord with state policy.’ (remaining citations omitted.)” *Nugget Hydroelectric, Inc. v. Pacific Gas & Electric Co.*, 981 F.2d 429, 434 (9th Cir. 1992).

It is our intention that the authority we are granting the IOUs in this decision, both to enter into the CRADA, and to carry out their responsibilities thereunder, is sufficient to confer antitrust immunity under the State Action Doctrine. In particular, it is our intention that the activities in which the IOUs jointly will participate under the CRADA shall be pursuant to the express direction and continuing supervision of the Commission in furtherance of an expressly articulated state policy, as articulated in Section 7 of this decision and

in Findings of Fact 57, 58, 59 and 60. We have included language to this effect in the Findings of Fact and Ordering Paragraphs, below.

In addition, we recognize that specific issues concerning compliance with antitrust laws can arise in the commercialization of any result from the research. As noted above, the intellectual property developed through this research project are “owned by the IOUs for the benefit of their customers....”¹⁶⁵ As such, the intellectual property would be a utility asset, and the commercialization of any project resulting from the research, such as a cybersecurity protection, would require separate application seeking approval of the Commission. In addition, any disposition of the intellectual property, such as a sale or licensing, would require a § 851 filing pertaining to the disposition of a utility asset.

In reviewing applications to commercialize or dispose of intellectual property or other value produced or derived from the CRADA, the Commission would supervise this activity and ensure that this intellectual property shall be licensed, sold, or otherwise encumbered only upon Commission approval pursuant to Section 851. Consistent with state law, the Commission would ensure that the licensing of intellectual property would be done on fair, reasonable, and non-discriminatory terms, including but not limited to a fair and reasonable licensing cost.

9. Outstanding Motions

9.1. Motion for Recusal

As mentioned in the background of this proceeding, on March 22, 2012, TURN filed a motion in the above captioned proceeding seeking the recusal of

¹⁶⁵ Ex. U-1 at 1-14.

assigned Commissioner Peevey with a number of emails attached to support its claim. TURN argues that documented communications between the President's office and stakeholders, including the applicants, prior to the filing of the application creates a situation where President Peevey cannot be an impartial decision-maker.

The Commission has reviewed the information presented by TURN and finds that the arguments made by TURN are unpersuasive.

9.1.1. Allegations of Pre-judgment in this Proceeding Should be Analyzed Using the Standard for Quasi-Legislative, Rather than Quasi-Adjudicatory, Proceedings.

In considering whether a Commissioner should be removed from a proceeding for prejudgment, the Commission first considers whether the proceeding is quasi-adjudicatory or quasi-legislative.¹⁶⁶ While this proceeding is categorized as "ratemaking" pursuant to PU Code sections 1701.1 et seq., for due process purposes there is no separate "ratemaking" category.

When performed by an administrative agency, ratemaking has been uniformly considered a quasi-legislative action.¹⁶⁷ A quasi-legislative proceeding is a forward-looking proceeding in which the Commission considers facts not for the purpose of adjudicating individual parties' rights, but rather for the purpose of making generalized rules or achieving broad policy goals.¹⁶⁸

¹⁶⁶ Association of National Advertisers, Inc. v. Federal Trade Commission (D.C. Cir. 1979) 627 F.2d 1151, 1168-1170.

¹⁶⁷ 20th Century Ins. Co. v. Garamendi (1994) 8 Cal.4th 216, 277.

¹⁶⁸ Assoc. of Nat'l Advertisers, Inc. v. Fed Trade Comm'n F.2d at 1165; Bi-Metallic Inv. Co. v. State Bd. of Equalization (1915), 239 U.S. 441, 445.

This proceeding addresses policy issues facing California's major electric utilities. The goal of this proceeding is to consider whether to approve a five-year research and development agreement between utilities and a government laboratory for the purpose of achieving utility cost savings, cyber security, and other policy goals for these utilities. The utilities involved have willingly come to the table to consider this project. Rights of the specific parties are not being adjudicated here.

Thus, this procedure is quasi-legislative for these purposes.

9.1.2. TURN Has Failed to Show By Clear and Convincing Evidence That President Peevey's Involvement in the Proceeding Constitutes an Unalterably Closed Mind

Decision makers at administrative agencies are accorded a presumption of impartiality.¹⁶⁹ A decision maker is barred from participating in a quasi-legislative proceeding only if it has been shown by clear and convincing evidence that he has an unalterably closed mind on matters critical to the disposition of the proceeding.¹⁷⁰ However, a decision maker at an administrative agency may exchange views with stakeholders and suggest public policy.¹⁷¹ Disqualifying every decision maker who held opinions on the appropriate course of future action "would eviscerate the proper evolution of policymaking" and substantially interfere with the development of agency policy.¹⁷²

¹⁶⁹ See *Morongo Band of Mission Indians v. State Water Resources Control Board* (2009) 45 Cal.4th 731, 737.

¹⁷⁰ *Assoc. of Nat'l Advertisers, Inc. v. Fed Trade Comm'n* F.2d at 1170.

¹⁷¹ *Id.* at 1165

¹⁷² *Id.* at 1171

Here, TURN asserts that “human experience and common sense” necessarily lead to the conclusion that President Peevey has an unalterably closed mind regarding the outcome of the proceeding. TURN points to communications between President Peevey and stakeholders in the early stages of developing the proposed agreement. They argue that President Peevey solicited the initial proposal from LLNL, was provided periodic updates regarding the communications between stakeholders, and urged the parties to complete the application for the project. TURN asserts that according to “human experience and common sense” President Peevey’s mind therefore must be unalterably closed regarding the outcome of this proceeding.

However, the test for pre-judgment is not whether based on “human experience and common sense” that an agency official’s mind is unalterably closed. The test is whether the challenger, in this case TURN, can show by clear and convincing evidence that President Peevey has an unalterably closed mind on matters critical to the disposition of the proceeding.¹⁷³

The communications put forth by TURN show actions explicitly approved by the court in *Assoc. of Nat’l Advertisers* and other cases. In *Assoc. of Nat’l Advertisers*, the FTC Chairman had not prejudged the issue of whether the FTC should regulate advertising to children, even though he made public statements suggesting that it would be proper for the FTC to do so.¹⁷⁴ In *Alaska Factory Trawler Ass’n*, the Regional Director had not prejudged the validity of a particular fishing regulation, even though he was a member of the council

¹⁷³ *Id.* at 1170.

¹⁷⁴ *Id.* at 1174.

charged with formulating the regulation.¹⁷⁵ In C&W Fish Co., the Assistant Administrator had not prejudged whether NOAA should implement a ban on gillnets even though he had been previously employed by a group that supported the ban, and made public comments in support of the ban.¹⁷⁶

Similarly, the communications presented by TURN show an agency official gathering information among stakeholders in an effort to do his job - make policy. There is no evidence, let alone clear and convincing evidence, that President Peevey is not open to considering the facts and arguments presented by the parties to this proceeding, and then forming a new opinion that potentially changes his mind. TURN's showing at most reveals that President Peevey sees an opportunity to fulfill the Commission's mandate of regulating California utilities and setting policy for them to promote a public interest by suggesting a partnership between LLNL and these utilities could produce efficacious research. But for this opportunity to even be considered, there must be an application put forth before the Commission. It is only once an application has been filed, and all parties who wish have an opportunity to present relevant information and argument, that any of the Commissioners can see the full picture and formulate a final opinion about whether the application should be approved.

TURN has failed to show by clear and convincing evidence that President Peevey has an unalterably closed mind regarding the outcome of the application. Therefore, President Peevey does not need to remove himself from the proceeding.

¹⁷⁵ Alaska Factory Trawler Ass'n v. Baldrige (9th Cir. 1987) 831 F.2d 1456, 1467

¹⁷⁶ C&W Fish Co., Inc. v. Fox Jr. (D.C. Circuit 1991) 931 F.2d 1556, 1563-1565

9.1.3. TURN's Use of "Appearance of Bias" is Improper

TURN has made no showing that a mere appearance of bias could require disqualification in a quasi-legislative proceeding. Thus, the "appearance of bias" standard used by TURN is inapplicable.

For all these reasons, this decision denies TURN's motion seeking the recusal of assigned Commissioner Peevey.

9.2. Other Motions

Throughout the proceeding, parties made numerous motions pertaining to the conduct of the procedures. Since this decision resolves all outstanding matters before the Commission in this proceeding, any outstanding motion is rendered moot.

10. Conclusion

In summary, the record in this proceeding demonstrates that this collaborative research project involving PG&E, SCE, SDG&E and LLNL is needed and will likely produce benefits that exceed costs. The super computer capabilities of LLNL will enable the development of better models of gas and electric operations, improvements in electric resource planning, improvements in gas systems operations and safety (including the quicker detection of leaks and weak pipes), improvements in cyber security that protect privacy and grid reliability, and the ability to handle the three terabytes of data generated daily by Smart Meters that provide micro-data on demand and grid flows.

In light of these facts, funding the CES-21 program is reasonable, and the \$152.19 million incurred to fund the program results in reasonable charges.

The policies adopted in this decision to guide the Board of Directors of the CES-21 project and the advice letter review process established assure that the research projects that emerge in the areas of gas operation, electric operations,

cyber security, and electric resources planning will conform with the guidelines in § 740.1.

11. Comments on Proposed Decision

The proposed decision of the ALJ in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed on November 19, 2012 by Joint Applicants, TURN and DRA. Reply comments were filed on November 26, 2012 by Joint Applicants and TURN.

The Joint Applicants sought specific clarifications and the decision has made these clarifications with one exception. We decline to permit research expenditures exceed \$30 million in any year.

TURN argues five points in its Comments. TURN reargues its request seeking the recusal of President Peevey. TURN argues that the record evidence establishes the expected benefits are "mere guesses." TURN asserts that the Commission should reject the application because it did not consider an alternative to LLNL. TURN argues that a Tier 3 Advice Letter is required. TURN also asks that the decision address a narrow cost allocation and cost recovery issue.

In response to TURN's recusal request, this decision declines to order the recusal of President Peevey. TURN has failed to show either bias or the appearance of bias.

On TURN's second point, this decision finds that TURN's argument that the estimate of \$552 million in load following savings is a "mere guess" fails to note that this was number was discussed in the evidentiary hearing. The witness testified concerning this matter under cross-examination by DRA:

A. Definitely these are illustrative. But it is a fair representation of the potential benefits of the project in this particular area of research.¹⁷⁷

This testimony directly contravenes TURN's allegation that the estimate is a "mere guess."

Concerning TURN's objection to the choice of LLNL as a partner, the decision is clear that the choice of LLNL was made because of its unique research capabilities. TURN's argument that the Commission should not consider the sworn testimony of a witness and that "the Commission needs to have something more to support that "unique" label than LLNL applying that label to itself in its pursuit of a \$150 million contract"¹⁷⁸ is unpersuasive. The ALJ found this testimony credible, and TURN presented no countervailing evidence.¹⁷⁹ TURN's argument that the Commission should require a Tier 3 advice letter is now moot. The decision now provides for a Tier 3 review. TURN's argument that the Commission should allocate costs associated with research on generation using generation-based allocation factors is reasonable, and this decision now adopts this policy. To the extent that a CES-21 project is generation-related, the utilities should allocate the generation-related costs using generation-based allocation

¹⁷⁷ TR at 213-214.

¹⁷⁸ TURN Comments on PD at 9.

¹⁷⁹ Not only did TURN fail to provide countervailing evidence, during the course of this proceeding, the popular press made it clear that LLNL possessed the fastest supercomputer in the world until November 2012, when Oak Ridge National Lab surpassed it. The Commission's knowledge of LLNL's research capabilities provided no grounds for doubting sworn testimony consistent with LLNL's national reputation and capabilities, and comports with common knowledge available in popular media.

factors, but with the cost recovery through distribution charges, which is a common Commission practice.

DRA's Comments argue again that any advice letter review provides insufficient Commission oversight. DRA argues again that the finding of ratepayer benefits from research is in error and that the decision errs in relying on illustrative cases. DRA also argues again that the decision errs in not adopting a competitive solicitation process.

In response, we find that DRA has raised no new argument that we have not addressed.

12. Assignment of Proceeding

Michael R. Peevey is the assigned Commissioner and Timothy J. Sullivan is the assigned ALJ in this proceeding.

Findings of Fact

1. This proceeding commenced on July 18, 2011.
2. Decision 12-05-037, which set procedures for the review of proposed research development and demonstration projects, was issued on May 31, 2012.
3. The CES-21 Project's objective is to apply computationally-based problem solving resources to the emerging challenges of the 21st century energy system of electrical and natural gas for California.
4. The application and testimony provided by the Joint Applicants presented illustrative examples of research in four areas: Gas System Operations, Electric System Operations, Electric Resource Planning and Cyber security.
5. PG&E, SCE, and SDG&E currently use commercial off-the-shelf or in-house developed modeling tools for planning electric systems.

6. The models that PG&E, SCE, and SDG&E use for electric resource planning are computationally intensive yet limited in their ability to represent the complexity of the grid.

7. The CES-21 project will seek to augment the functionality of existing models to better represent the complexity and responsiveness of the grid.

8. If research projects in this area prove successful, the CES-21 could provide benefits of \$30 million per year in reduced load following costs and \$552 in reduced resources by 2020 needed to integrate renewable resources.

9. In the area of electric operations, the enhanced monitoring and control capabilities produced by a successful research project, will help integrate renewable intermittent resources that are critical to meeting California's Renewables Portfolio Standard.

10. In the area of gas operations, the use of supercomputing systems and models will enhance the utilities ability to calculate and anticipate pressure changes on gas pipelines. This knowledge can improve the safety of gas operations.

11. Enhanced monitoring and modeling of gas operations will facilitate leak detection and system safety.

12. Advanced modeling of gas operation could permit gas companies to reduce pressures in the transmission system needed to meet distribution pressure needs, thereby improving transmission system safety and operating efficiencies.

13. Advanced modeling made possible by the CES-21 project could enable researchers to determine what it takes for a pipe to break as a function of soil type and gas pressure.

14. Enhanced modeling of gas flows could result in reduce transmission expenditures. If the expenditures on gas transmission are reduced by just one percent, that will result in a savings of \$1.7 million per year.

15. In the area of cyber security, the CES-21 anticipates that information sharing among PG&E, SCE, SDG&E and LLNL, which has cutting edge experience in cyber security, will enhance the utilities ability to meet cyber security challenges and result in a more reliable grid that can protect customer privacy.

16. In conducting research, discretion is necessary to enable researchers to uncover and pursue areas of research that their initial investigations show are promising and to abandon areas that initial research suggest will not prove productive.

17. The CES-21 research program will likely provide substantial benefits to Californian ratepayers, including economic savings, improved safety and operational reliability and improved operational security and protection of privacy.

18. The current ability of utilities to model gas operations and gas flows is very limited. Current models require the analyst to input valve settings and lack the ability to choose the optimal valve settings.

19. The current backbone of the gas system has over 10 valves and it would take over 1000 runs to optimize valve settings.

20. A more comprehensive and automated model of gas operations could enable a gas utility to use less gas to maintain flow pressures, and this would improve safety and efficiency.

21. A more comprehensive model of gas operations and gas flows would improve a utility's ability to detect leaks.

22. A more accurate model of gas operations and gas flows could improve estimates and thereby reduce the miles of pipes needed to meet a system need.

23. Advanced computing can enable the modeling of pipe breaks and thereby improve safety.

24. Smart meters will generate three terabytes of data a day, about the amount of data now in the Library of Congress.

25. The record in this proceeding identified only one facility with the speed and bandwidth needed to process the data generated by 20 million smart meters, and that was the supercomputing facilities at LLNL.

26. LLNL has developed cyber security procedures to protect the research it conducts on the nuclear weapons program.

27. The CES-21 project would open the opportunity to model the technical environment of utility operations and to improve the understanding the areas of weakness that would have the most significant negative impacts on customer service and operations.

28. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will offer a reasonable probability of providing benefits to ratepayers because the projected benefit exceed projected costs.

29. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will minimize projects which have a low probability for success.

30. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will be consistent with the corporation's resource plan because the research supports current operations, planning, and security.

31. The illustrative examples allow us to conclude that research projects limited to gas operations, electric operations, electric resource planning will improve public and employee safety and improve the operating efficiency and reliability and likely reduce operating costs.

32. Illustrative cases offer a reasonable way of investigating potential research when system priorities and technologies are undergoing rapid changes.

33. It is prudent to develop a business case for each particular research project that 1) maps planned research projects to the energy system value chain, 2) allocates funds from within the overall allocation to specific projects, 3) analyzes the justifications for specific projects against the goals for CES-21 listed in § 740.1, 4) reviews the project to ensure that it does not duplicate other research, and 5) assesses the project's benefits, including safety and environmental benefits, and its costs.

34. It is reasonable to require that the Board of Directors of the CES-21 review a business case for each particular research project.

35. It is reasonable to require that the Board of Directors of the CES-21 project hold public workshop with the California Public Utilities Commission at least 45 days in advance of the filing of a Tier 3 advice letter seeking approval of the CRADA and each research project to review research priorities and the business case for each of the proposed research projects.

36. It is reasonable to require that the Joint Applicants submit a Tier 3 advice letter filing seeking approval for the CRADA and for each research project. The advice letter should include the business case justification for each project.

37. It is reasonable to have a Tier 3 advice letter review process because of the importance of the research proposed in the CES-21 for California. A Tier 3

review ensures consideration of a resolution by the full Commission at a public meeting.

38. It is reasonable to require the advice letter to assess the net present value of the costs and projected benefits of a proposed research project following standard procedures used by the Commission, such as those used to calculate a Market Price Referent.

39. It is reasonable to require that the advice letter seeking approval of a specific research project demonstrate that it is not duplicative of existing research by reviewing research conducted by California utilities, by the California Energy Commission, by EPRI, and by the Department of Energy.

40. It is reasonable to require that the advice letter seeking approval of a specific research project demonstrate that it has the support of the majority of the CES-21 Board of Directors.

41. It is reasonable to require that, if an advice letter proposes a research project that is not funded by all three utilities, it must include an explanation.

42. The requirements that limit research to four productive areas and order the board to review the business case for each project and to provide an annual report to the Commission will ensure that all projects funded by the CES-21 program are consistent with the research guidelines set forth in § 740.1.

43. The requirement that the annual report provided to the Executive Director of the Commission by the Board of Directors of the CES-21 provide information on the costs of research, the results of research, the participation of individuals outside of LLNL and the three utilities, and intellectual property that results from the research is reasonable and in the public interest.

44. The requirements that require annual advice letter filings concerning proposed research enable the Commission to ensure that research is limited to

the four productive areas approved by the Commission and to ensure that each research has a positive business case.

45. Because of the research that forms the heart of the CES-21 project, it is reasonable that the Board of Directors consist of three directors, one chosen by each of PG&E, SCE, and SDG&E, and three directors chosen by the utilities who have experience in research institutes or academic departments relevant to the research proposals.

46. It is reasonable for the Director of the Energy Division, or the designee of the Director, to serve as a liaison to the CES-21 Board of Directors. The Director of the Energy Division can provide input in advance of advice letter filings concerning the information that the Commission needs to review an advice letter.

47. It is reasonable to limit the duration of the CES-21 program to five years.

48. It is reasonable to limit the overall expenditures on the CES-21 program to \$30 million per year and \$150 million over five years (152.19 including franchise fees and uncollectibles).

49. It is reasonable to allocate the funding of the projects as proposed among PG&E, SCE, and SDG&E, with PG&E responsible for 55% of the costs, SCE responsible for 35% of the costs, and SDG&E responsible for 10% of the costs.

50. It is reasonable that PG&E allocate 75% of its costs to electric distribution and recover these costs through the Distribution Revenue Adjustment Mechanism. To the extent that a CES-21 project is generation-related, it is reasonable to require that PG&E allocate the generation-related costs using generation-based allocation factors, but with the cost recovery through distribution charges.

51. It is reasonable that PG&E allocate 25% of its costs to gas revenue requirements, to be recovered through the Core Fixed Cost Account for core gas

customers and the Noncore Customer Class Charge Account for noncore customers

52. It is reasonable for SCE to recover its CES-21 costs through the Base Revenue Requirement Balancing Account, and SCE may book its CES-21 costs into that account for cost recovery. To the extent that a CES-21 project is generation-related, it is reasonable to require that SCE allocate the generation-related costs using generation-based allocation factors, but with the cost recovery through distribution charges.

53. It is reasonable for SDG&E to open a balancing account to record “the difference between its share of the program expenses, as described in the section on SDG&E’s CES-21 Revenue Requirements in Exhibit U-1, up to the maximum, and its annual revenue requirement. The ultimate disposition of this account would be addressed at SDG&E’s annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers. To the extent that a CES-21 project is generation-related, it is reasonable to require that SDG&E allocate the generation-related costs using generation-based allocation factors, but with the cost recovery through distribution charges.

54. This decision sets the policies to guide the drafting of the CRADA and the selection of research projects to include in a Tier 3 advice letter seeking approval of a specific CRADA and research projects.

55. TURN has not demonstrated by clear and convincing evidence that President Peevey’s involvement in this proceeding constitutes an unalterably closed mind.

56. TURN has not demonstrated an appearance of or actual bias by President Peevey in this proceeding.

57. The approval of the CES-21 project, as modified, promotes one of the cornerstones of California's energy policy, that of continuing ratepayer-funded research and development that ensures the continued safe, reliable, affordable, and environmentally sustainable electric service.

58. The approval of the CES-21 research project is intended to pool the experience, expertise, and resources of PG&E, SCE, and SDG&E to address some of the most challenging problems facing California energy policy: integrating intermittent energy from renewable resources into their supply portfolios while ensuring reliable service, improving electric and gas operations, combating cybersecurity threats, and processing unprecedented amounts of data from smart meters using LLNL's supercomputing capabilities.

59. The pooling the resources in the CES-21 research project – and ratepayer funds – of PG&E, SCE, and SDG&E maximizes the likelihood of successful R&D and is therefore consistent with state policy. Indeed, pooling IOU resources is warranted and prudent, because of both the complexity and interdependence of the electrical systems in California and the magnitude of cost to undertake the research and development to address these 21st century challenges.

60. It is state policy to promote the efficient use of ratepayer funds in research on energy issues.

61. The approval of the CES-21 project, including the coordinated efforts of PG&E, SCE, and SDG&E under a CRADA with LLNL, is consistent with state policy articulated in Findings of Fact 57, 58, 59 and 60.

Conclusions of Law

1. California state law supports Commission oversight of utility research projects.

2. Section 701 gives the Commission broad authority to supervise and regulate public utilities and to do all things necessary and convenient in the exercise of that power and jurisdiction.

3. Section 451 requires that all charges demanded or received by any public utility for any product or commodity furnished or to be furnished or any service rendered or to be rendered shall be just and reasonable.

4. Section 740 explicitly allows the inclusion of expenses for research and development.

5. Section 740.1 sets forth guidelines for the Commission to consider in evaluating research development and demonstration programs proposed by electrical and gas corporations.

6. Section 399 finds and declares, among other things, that in order to ensure that the citizens of California continue to receive safe, reliable, affordable and environmentally sustainable electric service, it is essential that prudent investments continue to be made to advance public interest RD&D programs not adequately provided by competitive and regulated markets.

7. In D. 11-12-035, the Commission found that for RD&D, §§ 740 and 740.1, added in 1973 and 1984, respectively, together with § 701, provide the Commission with authority to fund research and that these sections of the Pub. Util. Code remain in effect today, without modification since enactment.

8. Since this proceeding commenced before the institution of the EPIC rulemaking, the procedures adopted in that decision for the consideration of proposed research projects in triennial EPIC proceedings do not apply to the research projects proposed in this proceeding.

9. The requirements adopted for the CES-21 program that limit research to four productive areas, require a the business case for each project, require a

demonstration that the research is not duplicative, and require an annual advice letter filing ensure that all projects funded by the CES-21 program are consistent with the research guidelines set forth in § 740.1.

10. If the CRADA and the research projects conducted under the CRADA meet the guidelines and criteria set forth in this decision, then the research is in the public interest and consistent with the law.

11. If the CRADA and the research project conducted under the CRADA meet the guidelines and criteria set forth in this decision, and the costs fall within the \$30 million annual cap, and the ratemaking follows the procedures set forth, then the resulting expenses are reasonable and cost recovery should be authorized.

12. Since this decision adopts explicit guidelines for the drafting of the CRADA and specific criteria that a research proposal must meet, a Tier 3 advice letter process provides an appropriate mechanism for exercising Commission oversight.

13. Private party conduct is immune from antitrust liability under the State Action Doctrine, provided that the party claiming immunity shows that its conduct satisfies two requirements. First, it must be clearly articulated and affirmatively expressed as state policy. Second, the conduct must be actively supervised by the State itself.

14. It is the intention of this Commission that the participation by PG&E, SCE and SDG&E in the joint research arrangements with LLNL under the CRADA should enjoy antitrust immunity under the State Action Doctrine, because their participation in these arrangements will be in accordance with our express policy choice and direction, and because it will occur under our active and continuing supervision.

15. State supervision should ensure that any commercialization of intellectual property or other value produced or derived from the CRADA shall be licensed, sold, or otherwise encumbered only upon Commission approval pursuant to Section 851. Licensing of intellectual property must be done on fair, reasonable, and non-discriminatory terms, including but not limited to a fair and reasonable licensing cost.

16. Allegations of prejudgment in this proceeding should be analyzed using the standard for quasi-legislative, rather than quasi-adjudicatory, proceedings because the Commission in this forward-looking proceeding is approving generalized rules for achieving broad policy goals.

17. Decision makers at administrative agencies are accorded a presumption of impartiality. A decision maker is barred from participating in a quasi-legislative proceeding only if it has been shown by clear and convincing evidence that the decision maker has an unalterably closed mind on matters critical to the disposition of the proceeding.

O R D E R

IT IS ORDERED that:

1. The Joint Application of Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company to Recover Costs of an Agreement with Lawrence Livermore National Laboratory for 21st Century Energy Systems, a proposed research project, is authorized subject to the conditions set forth in Ordering Paragraphs 2 through 14.

2. The 21st Century Energy Systems research project is authorized for a five-year period and the total costs of the project shall not exceed \$150 million

during the five-year period (\$152.19 million including franchise fees and uncollectibles) and shall not exceed \$30 million in any single year.

3. Pacific Gas and Electric Company shall be responsible for 55% of the costs of the 21st Century Energy Systems research project. Pacific Gas and Electric Company is authorized to allocate 75% of these costs to electric distribution and recover these costs through the Distribution Revenue Adjustment Mechanism. Pacific Gas and Electric Company shall collect the full amount of the program's cost each year. Pacific Gas and Electric Company is permitted to modify the cost collection downward on an annual basis only to accommodate its actual share of program expenses. To the extent that a CES-21 project is generation-related, Pacific Gas and Electric Company shall allocate the generation-related costs using generation-based allocation factors, but with the cost recovery through distribution charges. Pacific Gas and Electric Company is authorized to allocate the remaining 25% of its costs to gas revenue requirements and recover these costs through the Core Fixed Cost Account (for core gas customers) and the Noncore Customer Class Charge Account (for noncore customers). Pacific Gas and Electric Company is authorized to open two balancing accounts, one electric and one gas, to record the difference between its share of the program expenses, up to the maximum, and its annual revenue requirement.

4. Southern California Edison Company shall be responsible for 35% of the costs of the 21st Century Energy Systems research project. Southern California Edison Company shall collect in the full amount of the program's cost each year. Southern California Edison Company is permitted to modify the cost collection downward on an annual basis only to accommodate its actual share of program expenses. To the extent that a CES-21 project is generation-related, Southern California Edison Company shall allocate the generation-related costs using

generation-based allocation factors, but with the cost recovery through distribution charges. Southern California Edison Company is authorized to recover these costs through the Base Revenue Requirement Balancing Account and to subsequently recover these costs.

5. San Diego Gas & Electric Company shall be responsible for 10% of the costs of the 21st Century Energy Systems research project. San Diego Gas & Electric Company shall collect the full amount of the program's cost each year. San Diego Gas & Electric Company is permitted to modify the cost collection downward on an annual basis only to accommodate its actual share of program expenses. San Diego Gas & Electric Company is authorized to open a balancing account to record the difference between its share of the program expenses, up to the maximum, and its annual revenue requirement. To the extent that a CES-21 project is generation-related, San Diego Gas & Electric Company shall allocate the generation-related costs using generation-based allocation factors, but with the cost recovery through distribution charges. The ultimate disposition of this account shall be addressed at San Diego Gas & Electric Company's annual Electric Regulatory Account Balance Update filing or other applicable proceeding, to be collected from electric distribution customers.

6. The 21st Century Energy Systems research project shall have a six member Board of Directors. The Board of Directors shall consist of three directors, one chosen by each of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company, and three directors, chosen by the utilities, who have experience in research institutes or academic departments relevant to the research proposals. The Director of the Commission's Energy Division or the Director's designees, shall serve as a non-voting liaison to the Board of Directors.

7. Meetings of the Board of Directors shall be open to the public and subject to public access in the same way as meetings of other California public agencies, as proposed in the application.

8. Prior to expending any funds authorized by this decision, Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company and Lawrence Livermore National Laboratory will negotiate and enter into a Cooperative Research and Development Agreement consistent with Ordering Paragraph 10. This Cooperative Research and Development Agreement shall be subject to final approval through a Tier 3 advice letter filed at the Commission.

9. Within 90 days of the adoption of this decision, the Joint Applicants shall file the Cooperative Research and Development Agreement, along with the proposed implementation plan and first year projects, as a Tier 3 advice letter with this Commission. The Commission will review this filing to ensure its consistency with the policy requirements adopted in this decision and enumerated in Ordering Paragraphs 10 and 12.

10. The Cooperative Research and Development Agreement and the 21st Century Energy Systems research project shall meet the following guidelines:

- a. The research shall be limited to the areas of cyber security, electricity operations, gas operations, and electric resource planning.
- b. The research shall be limited to \$30 million in a calendar year and be limited to \$150 million during the five years of the project.
- c. The implementing advice letters shall track and record, allocate, and recover costs consistent with ordering paragraphs 3, 4, and 5.
- d. The Board of Directors shall consist of six members, one designated by each utility, and three members with a

background in academic or institutional research selected by the three utilities.

11. The Board of Directors of the 21st Century Energy Systems research project shall administer and implement the policies adopted by the Commission concerning individual research projects, consistent with the CRADA and other conditions imposed by the Commission on the research projects approved in the annual Tier 3 advice letter filings.

12. The Joint Applicants shall ensure the preparation and the filing of the annual advice letters listing proposed research projects. Specifically, the Joint Applicants shall ensure that the annual advice letters demonstrate:

- a. That research projects are limited to the areas of electric system operations, electric resource planning, gas system operations and cyber security which this decision has identified as offering major research opportunities consistent with the needs of ratepayers;
- b. that the total spent on research in a given year in the 21st Century Energy Systems research project does not exceed \$30 million;
- c. that there is a positive business case for each proposed research project. The business case for each new research project proposed should i) demonstrate quantifiable customer benefits, including safety and environmental benefits exceed costs on a net present value basis, using an Commission approved methodology, such as that used in calculating a Market Price Referent. The business case should also ii) map planned research projects to the energy system value chain, iii) detail the project costs fall within the overall allocation to each specific project, iv) analyze the justifications for specific projects against the goals in Section 740.1, and v) ensure that the project does not duplicate other research. The purpose of the the business case is to ensure that funded projects in each of the four research areas are beneficial to ratepayers and to facilitate review and approval by the Commission. Therefore, the business case shall discuss the following: i) What is the overall

value of the results from the potential research to ratepayers and to the utility system's safety and reliability? ii) How do the costs of the research compare to potential benefits? iii) Would the results of the research have an impact on the ability of the grid to support the competitive provision of electric power or on the ability to integrate non-utility assets and distributed generation onto the grid? iv) Does the proposed research align with CPUC policies? Does it, for example, support, specific programs such as the Commission's 33% renewable goal by 2020 and Gas Pipeline Safety plans? v) Does the proposed research produce specific benefits concerning utility resources including transmission, distribution, generation, system operations, management, and oversight? vi) Does the research help foster safe, reliable service at just and reasonable costs?

- d. that the research projects do not duplicate other research funded by California utilities, the California Energy Commission, the Electric Power Research Institute, or the United States Department of Energy.
- e. that each proposed research project has the approval of a majority of the Board of Directors of the 21st Century Energy Systems research project.
- f. that, in the event that a research proposal is not funded by all research participants, that the advice letter include a full explanation for consideration by the Commission.

13. The 21st Century Energy Systems research program is authorized for five years. The five year period begins as of the effective date of the decision or the effective date of the first Advice letter, whichever is later. The 21st Century Energy Systems research program has a full 12 months to spend a program year's worth of funding.

14. In each year of the research project, the Joint Applicants shall file the proposed research projects and budget for the upcoming year as a Tier 3 advice letter with this Commission. With the exception of year 1, that advice letter shall be filed a minimum of 120 days prior to the expected start of any particular

program year. As part of the advice letter process, the Board of Directors of the 21st Century Energy Systems project shall hold a public workshop including the California Public Utilities Commission at least 45 days in advance of the filing, to discuss the proposed research and priorities and to review the business case for proposed research. The Commission will review the Tier 3 advice letter filing to ensure its consistency with the policy requirements adopted in this decision and enumerated in ordering paragraphs 10 and 12.

15. The Board of Directors of the 21st Century Energy Systems research project shall submit an annual report to the Executive Director of the Commission that provides information on the operations of the project, including the research projects funded, the results of the research, the efforts made to involve academics and other third parties, and the intellectual property that results from the research.

16. In recognition of the importance of the research Lawrence Livermore National Laboratory will undertake pursuant to the Cooperative Research and Development Agreement in advancing the policy goals of this Commission, we hereby confirm that Pacific Gas and Electric Company, Southern California Edison Company and San Diego Gas & Electric Company should jointly enter into the Cooperative Research and Development Agreement, and that in doing so they will be under the express direction and continuing supervision of the Commission in furtherance of expressly-articulated state policy.

17. Pacific Gas and Electric Company, Southern California Edison Company and San Diego Gas & Electric Company, in undertaking the activities described and authorized herein, shall be deemed to be doing so in compliance with this Commission's policy choices, and under this Commission's active and continuing

supervision, and thus shall enjoy immunity from antitrust laws in accordance with the State Action Doctrine.

18. Any commercialization of intellectual property or other value produced or derived from the CRADA shall be licensed, sold, or otherwise encumbered only upon Commission approval pursuant to Section 851. Licensing of IP must be done on fair, reasonable, and non-discriminatory terms, including but not limited to a fair and reasonable licensing cost.

19. TURN's motion for recusal of President Peevey is denied.

20. Application 11-07-008 is closed.

This order is effective today.

Dated _____, at San Francisco, California.